Public Works Department
Bombay Presidency

Irrigation Administration Report

Part II—Sind

For the Year 1931-32

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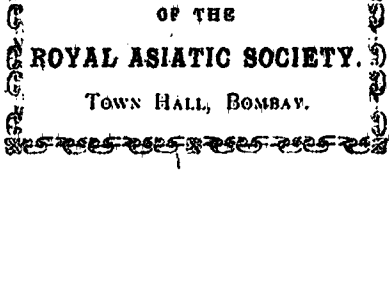

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G. P. .Z P. 1933.

DRAGLINE EXCAVATOR WORKING ON THE NARA WIDENING.

CONTENTS

	PAGES
Statement showing expenditure on establishment in the Roads and Buildings and the Irrigation Branches	At the beginning of the Report.
1. Description of Irrigation	1
2. Nature of Inundation and Rainfall	1–2
3. Indus Right Bank Circle—	
A. General Review of the results of the year 1931–32	2–12
B. Details of different works or groups of works and a comparison of the agricultural and financial results of the year 1931–32 with those of the previous year and the average of the last triennium, etc.—	
(*a*) Works for which capital accounts are kept	12–25
(*b*) Works for which capital accounts are not kept	25–27
4. Indus Left Bank Circle—	
A. General Review of the results of the year 1931–32	27–38
B. Details of different works or groups of works and a comparison of the agricultural and financial results of the year 1931–32 with those of the previous year and the average of the last triennium, etc.	
(*a*) Works for which capital accounts are kept	38–48
(*b*) Works for which capital accounts are not kept	48–50
5. Lloyd Barrage and Canals Construction	50–51
6. Indus River Commission	51–54
Commissioner in Sind's Review	55–58
Government Resolution reviewing the report	59–60

LIST OF DIAGRAMS, ILLUSTRATIONS AND MAPS

DIAGRAMS

Diagram showing expenditure on irrigation works from loan funds and revenue.
Diagram showing expenditure on establishment in the Roads and Buildings and Irrigation Branches. — At the beginning of the Report.

Diagram showing working Record for Jamrao Canal .. Facing page 44.

Diagram showing financial Record for Jamrao Canal .. Facing page 44.

Hydrographs of the River Indus at Bukkur and Kotri.. Facing page 52.

ILLUSTRATIONS

Lloyd Barrage—Sukkur—

Dragline excavator working on the Nara widening.. At the beginning of the Report.

Western Sind Circle, Manchar Drainage Division—

View showing machine 'Akbar' 300 Ruston excavating the New Cut to the Manchar Drain.. Facing page 50.

Southern Dadu Division—

Johi Branch Aqueduct over Main Drain Front View .. .. Facing page 50.

Southern Dadu Division—

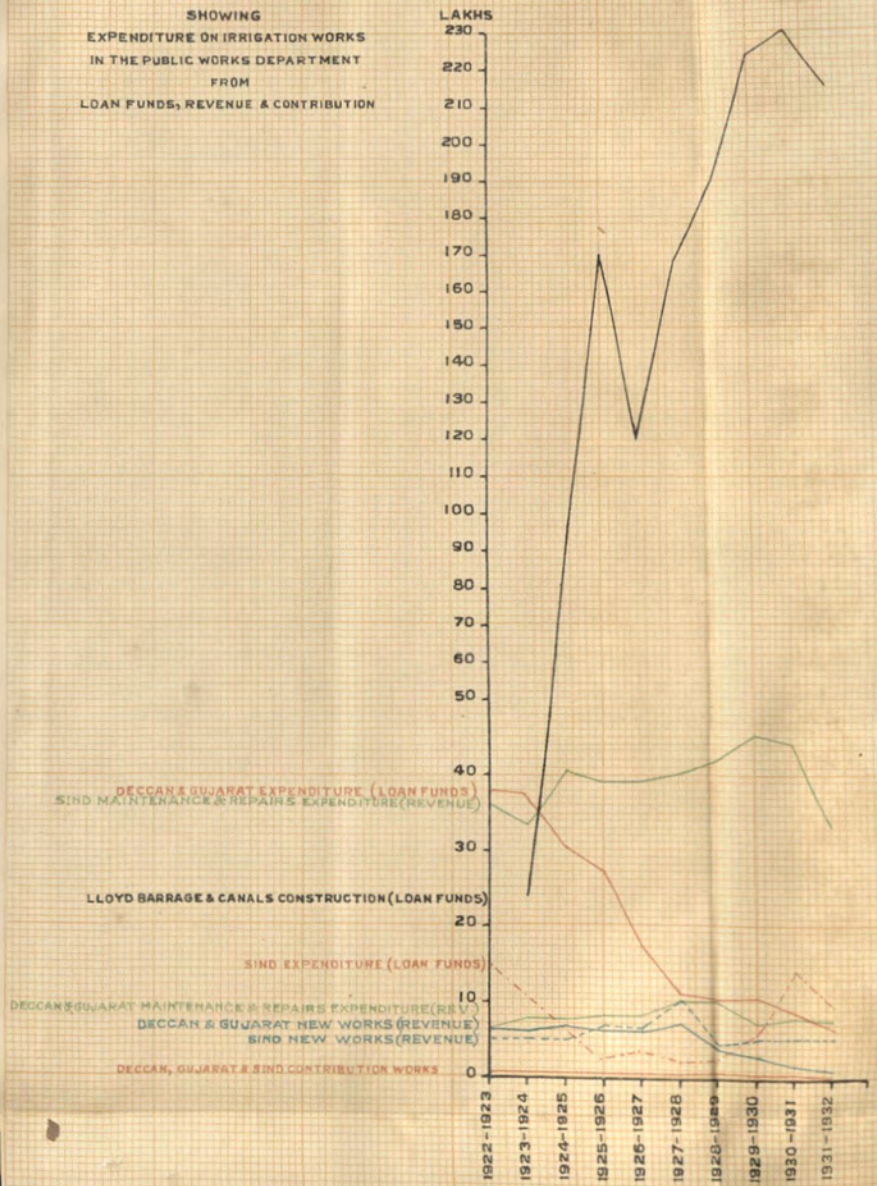
Johi Branch Aqueduct over Main Drain End View. Facing page 50.

MAPS

Index Map of Sind .. .. ..
Map of Sind showing all areas irrigated by existing inundation canals.
Map of Sind showing all areas to be irrigated by Lloyd Barrage and New Canals. — At end of Report.

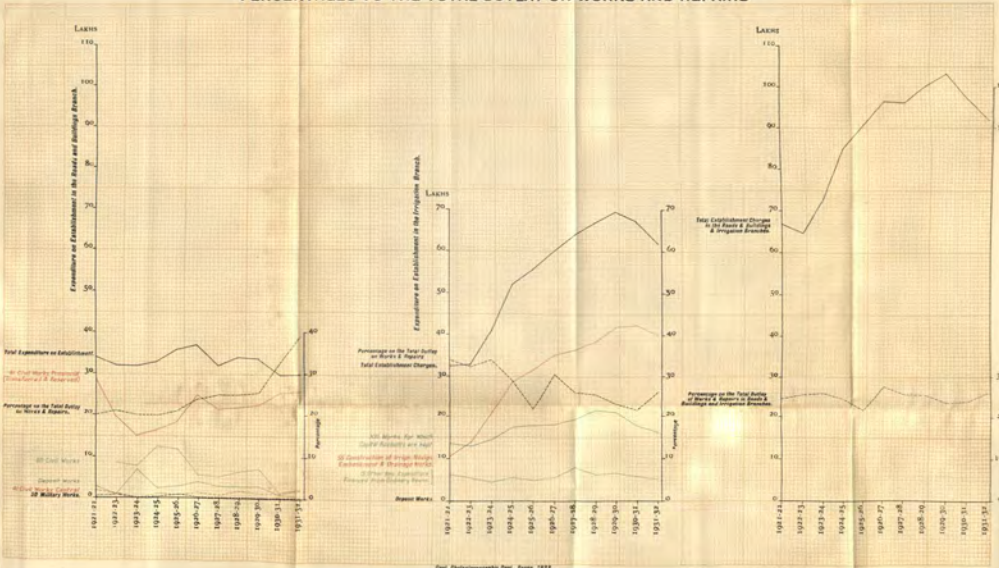
DIAGRAM

SHOWING
EXPENDITURE ON IRRIGATION WORKS
IN THE PUBLIC WORKS DEPARTMENT
FROM
LOAN FUNDS, REVENUE & CONTRIBUTION



G.P.Z.O. Poona, 1933.

DIAGRAM SHOWING EXPENDITURE
ON ESTABLISHMENT
IN THE
ROADS & BUILDINGS & IRRIGATION BRANCHES
OF THE
PUBLIC WORKS DEPARTMENT
AND
PERCENTAGES TO THE TOTAL OUTLAY ON WORKS AND REPAIRS



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Statement showing expenditure on establishment in the Roads and Buildings and the Irrigation Branches of the P. W. D. from the year 1921-22 to 1931-32 and percentage on the total outlay on works and repairs during that period in both the Branches.

Year.	Expenditure on Establishment in the Roads and Buildings Branch.							Expenditure on Establishment in the Irrigation Branch.
	41—Civil Works—Provincial (Transferred and Reserved).	60—Civil Works.	41—Civil Works—Central.	50—Military Works.	Deposit Works.	Total.	Percentage on the total outlay on works and repairs in the Roads and Buildings Branch.	55—Construction of Irrigation. Navigation, Embankment and Drainage Works.
1	2	3	4	5	6	7	8	9
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.
1921-22 ..	29,06,955	..	1,98,683	45,258	2,84,992	34,35,888	19·26	11,53,734
1922-23 ..	20,14,640	8,34,450	1,78,163	71,481	77,143	31,75,877	20·79	14,20,751
1923-24 ..	15,84,488	8,10,645	67,892	38,560	6,88,354	31,89,939	19·88	21,87,793
1924-25 ..	16,89,892	12,25,632	1,19,721	27,862	2,52,556	33,15,663	19·67	29,10,785
1925-26 ..	18,89,417	12,05,078	1,01,876	69,049	2,58,535	35,23,955	20·66	32,21,647
1926-27 ..	25,30,286	5,97,486	1,68,896	5,882	3,94,389	36,96,939	23·76	35,56,959
1927-28 ..	21,99,448	5,59,107	1,49,132	5,042	2,97,270	32,09,999	24·96	36,98,956
1928-29 ..	22,40,393	6,56,713	2,29,540	2,240	2,56,180	33,85,066	25·03	39,04,670
1929-30 ..	22,45,450	7,33,867	1,56,773	3,638	2,34,897	33,74,625	25·26	42,26,873
1930-31 ..	25,51,711	1,80,139	1,72,163	2,415	85,444	29,91,872	32·35	42,88,966
1931-32 ..	25,93,104	2,32,929	1,22,799	3,182	44,132	29,96,146	38·70	40,37,972

Year.	Expenditure on Establishment in the Irrigation Branch—*contd.*					Total Establishment charges in the Roads and Buildings and Irrigation Branches.	Percentage on the total outlay on works and repairs in Roads and Buildings and Irrigation Branches.
	XIII—Works for which capital accounts are kept.	15—Other Revenue Expenditure financed from Ordinary Revenues.	Deposit Works.	Total establishment charges.	Percentage on the total outlay on works and repairs in the Irrigation Branch.		
1	10	11	12	13	14	15	16
	Rs.	Rs.	Rs.	Rs.		Rs.	
1921-22 ..	13,85,960	6,68,651	2,770	32,11,115	33·59	66,47,003	24·26
1922-23 ..	13,44,901	5,34,327	1,993	33,01,972	32·22	64,77,849	25·38
1923-24 ..	14,43,222	4,32,013	2,056	40,65,084	33·89	72,55,023	25·87
1924-25 ..	17,37,724	5,26,361	492	51,75,362	28·73	84,91,025	24·35
1925-26 ..	17,99,343	5,19,228	2,681	55,42,899	21·62	90,66,854	21·23
1926-27 ..	18,08,385	5,94,989	3,207	59,63,540	30·56	96,60,479	27·54
1927-28 ..	19,20,773	7,80,312	3,847	64,03,888	26·00	96,13,887	25·64
1928-29 ..	21,35,939	6,16,601	2,750	66,59,960	25·51	1,00,45,026	25·35
1929-30 ..	21,08,302	6,18,312	1,012	69,54,499	23·26	1,03,29,124	23·88
1930-31 ..	18,31,149	5,99,621	1,734	67,21,470	21·60	97,13,342	24·06
1931-32 ..	16,34,011	5,18,627	86	61,90,696	22·40	91,86,842	25·97

NOTE.—The percentage of the establishment charges on the cost of works and repairs in the Irrigation Branch (column 14) is generally higher than that in the Roads and Buildings Branch (column 8). The reason is largely that the establishment charges in the Irrigation Branch include the cost of Special Revenue Establishment employed entirely on "revenue management" work on certain canal systems in Sind and the Deccan which has no connection with the execution of works and repairs, and that these charges also include cost of part of the time of Irrigation establishment spent on revenue management including the *control and distribution of water*, which is debited in the accounts to "revenue management" and not to execution of works and repairs. If these establishment charges debited in the accounts to "revenue management" are deducted from the total cost of establishment in the Irrigation Branch the percentage on the cost of works and repairs will not be so divergent. The increase in the rate per cent. in the R. & B. Branch is mainly due to decrease in outlay on "works" and "repairs". Establishment charges cannot be reduced in the same ratio in which expenditure on works is reduced. A mere overall percentage on expenditure on works is inaccurate.

IRRIGATION ADMINISTRATION REPORT, PART II—SIND—1931-32.

1. DESCRIPTION OF IRRIGATION.

1. The Province of Sind is situated beyond the influence of the south-west and the north-east monsoons, and in consequence its rainfall is normally scanty and unreliable. Unlike the greater part of India, therefore, the area of cultivation in Sind that depends solely or mainly upon rainfall is insignificant. The river Indus, however, brings down abundant supplies of water, the discharge at Sukkur rarely falling below 22,000 cusecs, while the average is as high as 110,000 cusecs. From where it enters the Province of Sind, the river is generally in deltaic formation, flowing along an elevated ridge formed by its own alluvial deposits. The indigenous system of irrigation by inundation canals takes advantage of this physical peculiarity. The device is primitive ; a channel is cut from the river approximately at right angles to its course : after a short distance the canal deviates to an alignment parallel to the river and commanding the low-lying lands falling away from the marginal ridge. These old irrigation works have been improved and extended while scientific methods have been introduced into the design and control of these canals, and many of them have been provided with head regulators. There are, however, inherent defects in this method of irrigation. The cultivation dependent on river inundations was principally kharif, and even this was subject to insecurity of supply owing to fluctuations in the river water levels. The low water supplies available during the winter season could be tapped only to a small extent and therefore this water largely ran to waste in the sea. As a result of the vagaries of a constantly changing river the inundation canals inevitably suffered from deficiency of supply during critical irrigation periods. From the year 1932 the area in Central Sind, excepting that commanded by the Rice Canal on the right bank of the river, is receiving an assured perennial supply of water from the Lloyd Barrage Canals. It is only in parts of Upper and Lower Sind, which are outside the sphere of influence of the Barrage, that a " Kharif " water supply only, continues to be available from the inundation canals. " Bosi Rabi " crops, however, are grown to a considerable extent in these areas, especially if the " abkalani " has been a late one.

2. NATURE OF INUNDATION AND RAINFALL.

2. The inundation of 1931 was characteristic for a low flood level, but on the whole, was a fairly good one as its duration was longer than usual.

3. The fair irrigating level of 13 feet on the Bukkur Gauge was first reached on the 14th of July 1931, and this level of 13 feet and over continued with fluctuations for 27 days as compared with 50 days in 1930, 49 days in 1929, 11 days in 1928 ; 37 days being the average of the last 3 years. The fair irrigating level of 17 feet on the Kotri Gauge was first reached on the 18th July 1931, and this reading of 17 feet or over was maintained for a period of 63 days, against 73 days in 1930, 58 days in 1929, 85 days in 1928 ; 72 days being the average of the last 3 years

4. The highest reading this year on Bukkur Gauge was 13·9 feet attained on 30th July 1931 as compared with 16·9 feet during 1930 and the maximum of 17·9 feet recorded on this gauge in the past. The highest reading on the Kotri Gauge recorded this year was 19·3 feet which was attained on 1st September as compared with 23·1 feet in 1930 and the maximum of 24·1 feet recorded on this gauge in 1929.

5. The rainfall during the season was below the average, and was not of material benefit to the crops as it fell mostly when the canals were running full.

6. The following table compares the principal features of the inundation with those of previous years :—

Gauges.	Average of ten years including 1930.	Average of three years including 1930.	1930.	1931.
	Days.	Days.	Days.	Days.
Bukkur 10 feet and over	78	81	91	85
Bukkur 13 feet and over	29	36	50	27
Kotri 14 feet and over	107	130	136	92
Kotri 17 feet and over	69	72	73	63

3. INDUS RIGHT BANK CIRCLE.

A—GENERAL REVIEW OF THE RESULTS OF THE YEAR 1931-32.

Area of cultivation, Government, Jagir and Foreign.

7. The gross assessed areas for the year are given in the subjoined statement A :—

Statement A.

Year and class of crops.	55—Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue A—Irrigation Works.			15—Other Revenue Expenditure financed from Ordinary Revenues A—Irrigation Works for which neither Capital nor Revenue Accounts are kept.	Grand total.
	Productive.	Unproductive.	Total.		
1	2	3	4	5	6
	Acres.	Acres.	Acres.	Acres.	Acres.
Average for three years ending 1930-31. Kharif ..	1,251,727	79,060	1,330,787	29,530	1,360,317
Rabi ..	338,092	17,047	355,139	37,364	392,503
Total ..	1,589,819	96,107	1,685,926	66,894	1,752,820

Statement A—contd.

Year and class of crops		55—Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue A—Irrigation Works.			15—Other Revenue Expenditure financed from Ordinary Revenues A—Irrigation Works for which neither Capital nor Revenue Accounts are kept.	Grand total.
		Productive.	Unproductive.	Total.		
1		2	3	4	5	6
		Acres.	Acres.	Acres.	Acres.	Acres.
1930–31 ..	Kharif ..	1,226,592	65,849	1,292,441	27,764	1,320,205
	Rabi ..	378,895	9,552	388,447	43,312	431,759
	Total ..	1,605,487	75,401	1,680,888	71,076	1,751,964
1931–32 ..	Kharif ..	1,160,478	56,054	1,216,532	23,386	1,239,918
	Rabi ..	341,541	13,643	355,184	28,018	383,202
	Total ..	1,502,019	69,697	1,571,716	51,404	1,623,120
Increase or decrease as compared with the average.	Kharif ..	— 91,249	— 23,006	— 114,255	— 6,144	—120,399
	Rabi ..	3,449	— 3,404	45	— 9,346	— 9,301
	Total ..	— 87,800	— 26,410	— 114,210	— 15,490	— 129,700
Increase or decrease as compared with the year 1930–31.	Kharif ..	— 66,114	— 9,795	— 75,909	— 4,378	— 80,287
	Rabi ..	— 37,354	— 4,091	— 33,263	— 15,294	— 48,557
	Total ..	—103,468	— 5,704	—109,172	— 19,672	— 128,844

The total cultivation of the year shows a decrease of 128,844 and 129,700 acres as compared with the figures for last year and the average of the previous three years, respectively. The area under kharif shows a decrease of 80,287 and 120,399 acres, respectively, compared with the areas of last year and with the average of the previous triennium. The area under rabi shows a decrease of 48,557 and 9,301 acres in both cases.

The area under " Dubari " or twice cropped land, which is not included in statement A, was 384,318 acres.

The " Dubari " figures for the previous year, and the average of the previous three years, were 408,345 and 371,286 acres, respectively.

Irrigation Assessment, Government and Jagir.

8. The net irrigation assessment, including Hakabo on foreign and Jagir lands, after deducting remissions, is given in Statement B :—

Statement B.

Net Consolidated Assessment.

Year and class of crops.		55—Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue A—Irrigation Works.			15—Other Revenue Expenditure financed from Ordinary Revenues A—Irrigation Works for which neither Capital nor Revenue Accounts are kept.	Grand total.
		Productive.	Unproductive.	Total.		
1		2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.	Rs.
Average of past three years including 1930-31.	Kharif ..	39,12,582	2,04,093	41,16,675	74,985	41,91,660
	Rabi ..	9,30,823	49,856	9,80,679	65,973	10,46,652
	Total ..	48,43,405	2,53,949	50,97,354	1,40,958	52,38,312
1930-31	Kharif ..	32,11,813	1,29,552	33,41,365	57,523	33,98,888
	Rabi ..	8,02,451	20,346	8,22,797	58,105	8,80,902
	Total ..	40,14,264	1,49,898	41,64,162	1,15,628	42,79,790

Statement B—contd.

Year and class of crops.		55—Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue A—Irrigation Works.			15—Other Revenue Expenditure financed from Ordinary Revenues A—Irrigation Works for which neither Capital nor Revenue Accounts are kept.	Grand total.
		Productive.	Unproductive.	Total.		
		2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.	Rs.
1931-32	Kharif ..	35,67,301	1,26,296	36,93,597	57,817	37,51,414
	Rabi ..	8,30,087	45,202	8,75,289	48,200	9,23,489
	Total ..	43,97,388	1,71,498	45,68,886	1,06,017	46,74,903
Increase or decrease as compared with the average.	Kharif ..	—3,45,281	— 77,797	—4,23,078	— 17,168	—4,40,246
	Rabi ..	—1,00,736	— 4,654	—1,05,390	— 17,773	—1,23,163
	Total ..	—4,46,017	— 82,451	—5,28,468	— 34,941	—5,63,409
Increase or decrease as compared with the year 1930-31.	Kharif ..	3,55,488	— 3,256	3,52,232	294	3,52,526
	Rabi ..	27,636	24,856	52,492	— 9,905	42,587
	Total ..	3,83,124	21,600	4,04,724	— 9,611	3,95,113

The net assessed revenue shows an increase of Rs. 3,95,113, and a decrease of Rs. 5,63,409, as compared with the figures for last year and the average of the previous three years, respectively.

Cultivation on river spill.

9. The area cultivated on spill water during the year was 12,676 acres, compared with 139,463 acres last year and 77,095 acres, the average of the previous three years.

Assessment rate per acre.

10. The average net consolidated assessment, per acre, on Government land, compared with that of the previous year and the average of the previous three years is given below :—

——	Average of previous 3 years.	1931–32.	1930–31.
	Rupees per acre.		
55—Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue—			
1. Productive	3·13	3·17	2·63
2. Unproductive	2·56	2·51	1·97
75—Other Revenue Expenditure financed from Ordinary Revenues Works for which neither Capital nor Revenue Accounts are kept	2·24	2·18	1·75
Average of all works ..	3·15	3·11	2·56

Actual realizations under all heads and the balances outstanding.

11. The following statement shows the realizations under all heads and the balances outstanding at the end of the year :—

Statement C.

Years.	Government land Hakabo.	Collections. Miscellaneous.	Collections. Four per cent. irrigation share of proceeds from sale of occupancy rights.	Total Receipts.	Balance outstanding.
1	2	3	4	5	6
	Rs.	Rs.	Rs.	Rs.	Rs.
Average of past three years.	45,89,962	75,999	79,489	47,45,450	3,66,004
1930–31 ..	34,43,905	61,603	80,352	35,85,860	6,92,345
1931–32 ..	45,11,258	58,984	81,497	46,51,739	4,25,670
Increase or decrease as compared with 1930–31 ..	10,67,353	— 2,619	1,145	10,65,879	— 2,66,675
Increase or decrease as compared with the average of three years ..	— 78,704	— 17,015	2,008	93,711	59,666

The balance outstanding at the end of the year shows a decrease of Rs. 2,66,675 compared with the last year's figure, and an increase of Rs. 59,666 compared with the average figure of the past three years.

Remission on Government land.

12. The remission on Government land granted during the year amounted to Rs. 10,23,904, compared with Rs. 18,29,101 and Rs. 9,21,731, of the previous year and the average of the previous three years, respectively.

Remission on Jagir land.

13. No remission was granted on Jagir land this year. The remissions during the previous year, and the average of the previous three years were Rs. 1,232 and Rs. 4, respectively.

Remission on foreign land.

14. The remission on lands in Foreign Territory (Kalat) amounted to Rs. 38,374, compared with Rs. 7,355 last year, and Rs. 8,492 the average of the previous three years.

The following statement gives details of the causes of remissions, with a comparison of the previous year's figures :—

Causes of remissions.	1930-31.	1931-32.	Difference.
	Rs.	Rs.	Rs.
Deficiency of water..	5,64,716	3,24,569	— 2,40,147
Breaches in Canals	2,69,647	1,82,758	— 86,889
Blight or Mahlo	12,357	15,463	3,106
Wire worms or insects	16,790	20,972	4,182
Floods	2,27,765	63,480	— 1,64,285
Frost	49,805	32,976	— 16,829
Locust	264	875	611
Rats	5,240	13,762	8,522
Revised Settlement	878	132	— 746
Kalar Soil	5,135	8,737	3,602
Other causes	6,83,335	2,68,957	— 4,14,378
Erosion	188	243	55
Adverse winds	1,558	1,437	— 121
Fire	10	....	— 10
Hill Torrents	....	....	....
Special remissions	....	89,543	89,543
Total ..	18,37,688	10,23,904	— 8,13,784

15. The loss of canal Revenue during the year due to the low rates charged to the Jagirdars in Sind and Zamindars in Kalat Territory amounted to Rs. 2,52,345.

Loss to Canals in foreign and Jagir lands.

16. The total charges during the year on account of maintenance and repairs amounted to Rs. 30,30,247 as under :—

	Rs.
Works	21,70,061
Establishment and Tools and Plant charges ..	5,83,625
Revenue collections	2,76,561
Total ..	30,30,247

The expenditure on establishment charged to works amounted to Rs. 4,39,202 while the net expenditure on works (clearance and repairs) was Rs. 17,30,859. As compared with last year and the average of the previous 3 years, the net expenditure on clearance and repairs shows a decrease of Rs. 8,77,683 and Rs. 7,23,182, respectively.

Expenditure on Maintenance and Repairs separately for Canals and River Embankments.

17. Of the total charges shown in the preceding paragraph, Rs. 20,69,952 were on canals and Rs. 9,60,295 on river embankments.

Outlay on New Works.

18. The outlay during the year on new works, including Establishment and Tools and Plant charges was Rs. 7,41,862 as shown below :—

		Rs.
55—Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue—		
Productive	Capital ..	30,815
	Revenue ..	14,971
Unproductive	Capital ..	3,52,831
	Revenue ..	....
15—Other Revenue Expenditure financed from Ordinary Revenues—		
Works for which neither Capital nor Revenue Accounts are kept ..		3,43,245
Total ..		7,41,862

Financial Results.

19. The general financial results of all Irrigation works in this Circle are shown in the following statement D :—

Statement D.

Class of Works.	Gross Revenue.	Working expenses.	Net Revenue	Simple Interest.	Net Profit, 1931-32.	Net Profit, 1930-31.	Increase.	Decrease
1	2	3	4	5	6	7	8	9
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
55—*Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue*—								
Productive ..	43,76,246	19,08,233	24,68,013	5,15,258	19,52,755	—54,677	20,07,432	..
Unproductive ..	1,64,879	1,91,503	—26,624	80,071	—1,06,695	—1,20,984	14,289	..
Total ..	45,41,125	20,99,736	24,41,389	5,95,329	18,46,060	—1,75,661	20,21,721	..
75—*Other Revenue Expenditure financed from Ordinary Revenues*								
Works for which neither Capital nor Revenue accounts are kept.	4,93,531	13,03,640	—8,10,109	..	—8,10,109	—12,22,527	4,12,418	..
1931-32 ..	50,34,656	34,03,376	16,31,280	5,95,329	10,35,951	....	..	..
1930-31 ..	35,82,326	44,08,332	—8,26,006	5,72,182	....	—13,98,188	24,34,139	..
Increase or decrease.	14,52,330	—10,04,956	24,57,286	23,147	—24,34,139		....	..

20. The following statement shows the expenditure per acre of area irrigated under all classes of works, excluding the cost of surveys for definite projects :—

Statement E.

Total area irrigated by all classes of works	Total working expenses and maintenance of canals.	Rate of working expenses per acre of area irrigated (column 2÷1).	Expenditure on agricultural works (excluding cost of surveys for special projects).	Rate of expenditure on agricultural works per acre of area irrigated (column 4÷1).	Total working expenses per acre of area irrigated including expenditure on agricultural works (column 3÷5).
1	2	3	4	5	6
Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
1,623,120	20,99,736	1·29	13,03,640	0·80	2·09

The total working expenses including those on agricultural works, amount to Rs. 2·09 per acre of the total area irrigated, compared with Rs. 2·52 per acre of the area irrigated last year, and Rs. 2·54 per acre of the average area irrigated during the past three years.

Length of Canals and Bunds.

21. The mileage of main canals in operation during the year was 1,327 and that of branch canals 2,026 or a total of 3,353 as compared with 3,335 miles last year. The total length of river embankments maintained was 604 miles compared with 577 miles last year.

Areas of principal crops : Government, Foreign and Jagir.

22. The areas of principal crops grown during the year were :—

Statement F.

Crops.		1931-32. Lift.	Flow.	Total.	Average of previous three years.	1930-31.	Increase or decrease as compared with average.	Increase or decrease as compared with 1930-31.
1		2	3	4	5	6	7	8
		Acres.	Acres.	Acres.	Acres	Acres.	Acres.	Acres.
Kharif	Rice ..	43	795,713	795,756	834,139	856,960	—38,383	—61,204
	Jowari ..	94,059	242,079	336,138	370,770	320,008	—34,632	16,130
	Bajri ..	23,146	41,319	64,465	96,266	94,007	—31,801	—29,542
	Cotton ..	208	55	263	1,544	779	—1,281	—516
	Sugarcane ..	1,163	16	1,179	....	....	1,179	1,179
	Other Crops .	5,642	36,869	42,511	57,598	48,451	—15,087	—5,940
	Total ..	124,261	1,116,051	1,240,312	1,360,317	1,320,205	—120,005	—79,893
Rabi	Wheat ..	9,864	175,005	184,869	227,821	248,777	—42,952	—63,908
	Barley ..	112	3,400	3,512	5,567	5,041	—2,055	—1,529
	Oil Seeds ..	4,687	132,230	136,917	173,642	171,893	—36,725	—34,976
	Other Crops	518	441,726	442,244	356,759	414,393	85,485	27,851
	Total ..	15,181	752,361	767,542	763,789	840,104	3,753	—72,562
Grand Total ..		139,442	1,868,412	2,007,854	2,124,106	2,160,309	—116,252	—152,455

Compared with the last year and the average of the previous three years, there were decreases of 79,893 and 120,005 acres respectively, under kharif, and a decrease of 72,562 acres and increase of 3,753 acres, respectively, under rabi.

Percentage of Kharif.

23. The percentage proportions of Kharif and Rabi to the total area irrigated were 62 and 38 compared with 61 and 39 last year. The highest Kharif percentage obtained was 89 in the Karachi Canals Division and the lowest 52 in the Begari Canals Division, while in the

Shikarpur Canals, Ghar Canals and Western Nara Divisions the percentages were 68, 63 and 60 respectively.

The Ghar Canals, Karachi Canals and Western Nara Divisions produced, as usual, the largest rice areas with 253,060, 181,917 and 189,982 acres respectively, out of the total rice cultivation of 795,756 acres for the Circle.

The largest areas under Jowari were obtained in the Begari Canals and Shikarpur Canals Divisions with 176,446 and 84,651 acres respectively, while the largest area under Bajri was, as usual, in the Begari Canals Division, viz., 43,294 acres.

Of the Rabi crops, wheat was largely grown in the Begari Canals Division with an area of 79,836 acres out of the total area of 184,869 acres in the whole Circle : the Western Nara, Ghar Canals and Shikarpur Canals Divisions had 38,606, 37,612 and 27,312 acres respectively. The largest area under oil seeds was, as usual, in the Begari Canals Division, viz., 59,055 acres out of total for the Circle of 136,917 acres, the Shikarpur Canals Division recording the lowest, viz., 4,485 acres only.

Of the total area irrigated during the year, 93 per cent. was watered by flow and 7 per cent. by lift cultivation.

24. The duties and deltas obtained in this Circle show the usual fluctuations as detailed, for each main canal, in the following statement :—

Canal.	Year under report.		Last year.		Remarks.
	Duty Acres per cusec.	Delta feet.	Duty Acres per cusec.	Delta feet.	
	2	3	4	5	6
(i) *Begari Canals Division.*					
Desert Canal ..	56	4·14	89	3·0	
Unherwah ..	54	6·22	76	4·0	
Begari Canal ..	57	7·68	105	3·6	
(ii) *Shikarpur Canals Division.*					
Mahiwah ..	42	5·81	42	5·0	
Canals in Rohri ..	27	7·63	26	7·3	
Sind Canal ..	48	5·12	65	3·6	
Rajib Canal ..	42	4·62	51	4·0	
Chiti Canal ..	62	3·16	55	3·7	
Garang Canal ..	39	4·62	31	6·6	
(iii) *Ghar Canals Division.*					
Sukkur Canal ..	53	5·13	91	3·0	
Ghar Canal ..	75	4·0	50	5·1	

Canal.	Year under report.		Last year.		Remarks.
	Duty Acres per cusec.	Delta feet.	Duty Acres per cusec.	Delta feet.	
1	2	3	4	5	6
(iv) Western Nara Division.					
Western Nara including Pritchard.	69	4·0	69	5·0	
Marvi Wah ..	27	8·4	60	4·4	
Phitta Canal ..	23	7·5	39	5·6	
Dadu Canals ..	81	3·0	42	6·0	
(v) Karachi Canals Division.					
Sattah Canal ..	22·2	10·9	19·4	14·6	
Pinyari Canal ..	44·4	7·9	49·2	6·3	
Kalri Canal ..	16·8	15·2	19	14·4	Water was not fully utilized on the new Narichach Canal of the Kalri system.
Baghar Canal ..	6·8	50·8	12	24·3	Part of the discharge escaped to the sea.

25. On the "Productive" works classed under "55–Construction of Irrigation, Navigation, Embankment and Drainage Works," the incidence of working expenses on assessed revenue and per acre irrigated were 45·05 per cent. and Rs. 1·26 per acre respectively, compared with 70·4 per cent. and Rs. 1·65 per acre in the previous year, the corresponding figures on "Unproductive" works being 118·65 per cent. and Rs. 2·75 per acre respectively.

26. The total value of crops, grown on the irrigated area of 2,007,854 acres, as estimated by the Revenue authorities was Rs. 2,76,40,364, which gives an average value of Rs. 13·8 per acre.

B.—DETAILS OF DIFFERENT WORKS OR GROUPS OF WORKS AND A COMPARISON OF THE AGRICULTURAL AND FINANCIAL RESULTS OF THE YEAR 1931-32 WITH THOSE OF THE PREVIOUS YEAR AND THE AVERAGE OF THE PREVIOUS TRIENNIUM, AND THE MAIN CAUSES OF ANY IMPORTANT DIFFERENCES IN RESULTS.

(a) Works for which Capital Accounts are kept.

(1) PRODUCTIVE.

Desert Canal.

27. The new head was opened on the 15th June 1931, for feeding the Adiowah, and ceased flowing on the 26th September 1931. Erosion at the new head continued throughout the season with the result that a silt bar

of about 2 feet deep was formed in the whole length up to Adiowah. Owing to the unstable conditions at the new head, the old head was again used this year to feed the Desert Canal System.

Capital.—No expenditure was incurred under this head during the year.

Extensions and Improvements.—A sum of Rs. 2,111 was spent during the year on providing regulator gates to the sluices along part of the Uch Rajwah, ex mile 52/3 right bank, Desert Canal.

Maintenance and Repairs.—The canal with its branches was maintained in good order at a cost of Rs. 1,52,552 including work-charged establishment.

Irrigation.—The total area irrigated during the year was 230,968 acres of which 129,474 were under kharif and 101,494 acres under rabi, compared with 210,075 acres last year and 202,906 acres the average of the previous three years.

Financial Results.—The gross revenue from all sources amounted to Rs. 4,08,427, compared with Rs. 2,59,232 last year and Rs. 3,41,228 the average of the previous three years. Deducting the working expenses, viz. Rs. 2,18,424, the net revenue during the year was Rs. 1,90,003.

General Remarks.—The remissions granted amounted to Rs. 1,93,963 compared with the amount of Rs. 1,71,305 remitted last year.

The principal crops grown were :—

Rice	.. .. ..	35,370 acres.
Jowari	.. .. ..	72,006 ,,
Bajri	.. .. ..	17,729 ,,
Wheat	.. .. ..	27,048 ,,
Oil Seeds	.. .. ..	17,902 ,,

and the value of the whole outturn is estimated at Rs. 26,09,129 or an average of Rs. 11 per acre.

UNHARWAH.

28. This canal worked very satisfactorily. The Full Supply Level of 9 feet and over was obtained for 74 days. The canal was opened on the 31st May 1931 with a Bukkur gauge reading of 8 feet. It flowed for 168 days and was artificially closed on the 15th November 1931.

Capital.—No expenditure was incurred under this head during the year.

Extensions and Improvements.—No expenditure was incurred during the year under this head.

Maintenance and Repairs.—The canal with its branches was maintained in good order at a cost of Rs. 48,500 including work-charged establishment.

Irrigation.—The total area irrigated during the year was 112,178 acres, of which 50,170 acres were under kharif and 62,008 acres under rabi, compared with 103,917 acres last year, and 109,672 acres the average of the previous three years.

Financial Results.—The gross revenue from all sources amounted to Rs. 2,25,771 compared with Rs. 1,32,570 last year, and Rs. 2,03,421 the average of the previous three years. Deducting working expenses viz. Rs. 75,362, the net revenue during the year was Rs. 1,50,409. The increase in gross revenue this year is due to a greater area being placed under cultivation on account of the satisfactory working of the Canal.

General Remarks.—The remissions during the year amounted to Rs. 83,376 compared with an amount of Rs. 88,118 remitted last year.

The principal crops grown were :—

Rice	.. .. ..	9,219 acres.
Jowari	.. .. ..	23,049 ,,
Bajri	.. .. ..	14,678 ,,
Wheat	.. .. ..	16,814 ,,
Oil Seeds	.. .. ..	9,622 ,,

and the value of the whole outturn is estimated at Rs. 9,72,381 or an average of Rs. 9 per acre.

Begari Canal.

29. The canal was opened on the 1st June 1931 and was in flow for 197 days. It had an excellent supply throughout the season and the new Feeder continued to work satisfactorily. The Eden and the Sir Canals—the tail branches of the Begari—were given an excellent supply. At the close of the year they were detached from the Begari for being fed from the Khirtar Branch of the new Barrage Canals.

Capital.—No expenditure was incurred during the year under this head.

Extensions and Improvements.—A sum of Rs. 70 was spent during the year on certain minor works under this head.

Maintenance and Repairs.—The canal and its branches were maintained in good order at a cost of Rs. 3,02,391, including work-charged establishment.

Irrigation.—The total area irrigated during the year was 377,951 acres of which 196.189 acres were under kharif and 181,762 under rabi, compared with 405,591 acres last year, and 385,202 acres the average of the previous three years.

Financial Results.—The gross revenue from all sources was Rs. 7,42,044 as compared with Rs. 5,08,368 last year and Rs. 7,60,066 the average of the previous triennium. Deducting working expenses viz. Rs. 4,35,343, and the share due to old irrigation, viz. Rs. 24,854, the net revenue due to improvements was Rs. 2,81,847. The increase in the gross revenue this year in spite of the decrease in the area under cultivation, is due to the grant of fewer remissions.

General Remarks.—The remissions given amounted to Rs. 2,94,011 against the amount of Rs. 3,75,287 remitted last year.

The principal crops grown were :—

Rice	..	95,894 acres.
Jowari	..	80,153 ,,
Wheat	..	34,714 ,,
Oil Seeds	..	31,443 ,,

The value of the whole outturn is estimated at Rs. 47,65,375 or an average of Rs. 13 per acre.

Sukkur Canal.

30. The Sukkur Canal has 2 heads, one for kharif called the Rahuja Head, and the other for rabi known as the old head. The new feeder for the Rahuja head worked satisfactorily. The canal was closed at the head on the 15th October 1931 in order to allow the widening of the canal to be completed in time for the Barrage Canals to flow.

Capital.—No expenditure was incurred under this head during the year.

Extensions and Improvements.—No expenditure was incurred under this head during the year.

Maintenance and Repairs.—The canal and its branches were maintained in good order at a cost of Rs. 44,543 including work-charged establishment.

Irrigation.—The total area irrigated during the year was 110,395 acres, of which 66,953 acres were under kharif and 43,442 acres under rabi, compared with 121,806 acres irrigated last year, and 115,537 acres the average of the previous three years.

Financial Results.—The gross revenue of the year amounted to Rs. 2,78,150, compared with Rs. 2,12,097 last year, and Rs. 2,61,634 the average of the previous three years. Deducting working expenses, viz., Rs. 81,631, and the share due to old irrigation, viz., Rs. 71,444, the net revenue due to improvements was Rs. 1,25,075.

General Remarks.—The remissions given amounted to Rs. 29,740, compared with an amount of Rs. 90,867 remitted last year.

The principal crops grown were :—

Rice	..	45,477 acres.
Jowari	..	17,900 ,,
Wheat	..	13,792 ,,
Oil Seeds	..	5,687 ,,

The value of the whole outturn is estimated at Rs. 11,75,082 or an average of Rs. 11 per acre.

Ghar Canal.

31. This canal flowed from 24th May 1931 to 24th October and had a very good supply. It was fed from the Arab Dhoro which worked extremely well.

Capital.—No expenditure was incurred under this head during the year.

Extensions and Improvements.—No expenditure was incurred under this head during the year.

Maintenance and Repairs.—The canal and its branches were maintained in good order at a cost of Rs. 90,321 including work-charged establishment.

Irrigation.—The total area irrigated during the year was 360,104 acres, of which 227,837 acres were under kharif and 132,267 acres under rabi, compared with 378,917 acres last year and 371,634 acres the average of the previous three years.

Financial Results.—The gross revenue of the year amounted to Rs. 10,04,759 compared with 7,51,662 last year, and Rs. 9,28,413 the average of the past three years. Deducting working expenses, viz., Rs. 1,85,086 and the share due to old irrigation, viz., Rs. 1,16,671, the net revenue was Rs. 7,03,002.

General Remarks.—The remissions amounted to Rs. 38,852, compared with Rs. 2,81,000 remitted last year.

The principal crops grown were :—

Rice	.. .. ..	207,583 acres.
Jowari	.. .. ..	15,574 ,,
Wheat	.. .. ..	23,763 ,,
Oil Seeds	.. .. ..	25,010 ,,

The value of the whole outturn is estimated at Rs. 54,02,598 or Rs. 15 per acre.

Canals in Rohri.

32. This system consists of small canals situated on the Left Bank of the Indus. All these canals worked statisfactorily with the exception of the Garkino, Janeb, Lundi and Mahesrowah.

Capital.—An expenditure of Rs. 34,817 was incurred under this head during the year, on regrading and moduling Channel No. 1.

Extensions and Improvements.—A sum of Rs. 2,237 was spent under this head on minor works.

Maintenance and Repairs.—The canals were maintained in good order at a cost of Rs. 79,071 including work-charged establishment.

Irrigation.—The total area irrigated during the year was 47,583 acres, of which 35,025 acres were under kharif and 12,558 acres under rabi, compared with 50,691 acres last year and 57,938 acres the average of the previous three years.

Financial Results.—The gross revenue amounted to Rs. 1,18,682, compared with Rs. 1,10,654 last year, and Rs. 1,40,406 the average of the previous three years. Deducting working expenses, viz., Rs. 1,10,683, the net revenue was Rs. 7,999.

General Remarks.—The remissions amounted to Rs. 18,758, against an amount of Rs. 34,336 remitted last year.

The principal crops grown were :—

Jowari	.. .. ..	27,200 acres.
Bajri	.. .. ..	3,099 ,,
Wheat	.. .. ..	7,304 ,,

The value of the whole outturn is estimated at Rs. 3,78,652, or an average of Rs. 8 per acre.

Sind Canal.

33. The Sind Canal was opened on 9th June 1931 and flowed for 141 days. The New Feeder gave trouble on account of heavy erosion at its head, and a new mouth was excavated at mile 24/6 of the Sukkur Begari Bund. On the whole the canal, and its branches, worked satisfactorily.

Capital.—A sum of Rs. 24,836 was spent under this head during the year.

Extensions and Improvements.—No expenditure was incurred under this head.

Maintenance and Repairs.—The Canal and its branches were maintained in good order at a cost of Rs. 1,51,919, including work-charged establishment.

Irrigation.—The total area irrigated during the year was 69,570 acres, of which 46,030 acres were under Kharif, and 23,540 acres under rabi, compared with 101,137 acres irrigated last year, and 89,684 acres, the average of the previous three years.

Financial Results.—The gross revenue amounted to Rs. 2,00,313, compared with Rs. 1,65,865 last year, and Rs. 2,33,355 the average of the previous three years. Deducting working expenses, viz. Rs. 2,04,724, the net revenue was minus Rs. 4,411. The decrease in the gross revenue this year was due to the decrease in the area under cultivation.

General Remarks.—The remissions granted amounted to Rs. 44,782, compared with Rs. 1,71,498 last year.

The principal crops grown were :—

Rice	.. .. ..	17,891 acres.
Jowari	.. .. ..	22,419 ,,
Wheat	.. .. ..	7,160 ,,

The value of the whole outturn is estimated at Rs. 5,20,406, or an average of Rs. 7 per acre.

Rajib, Chitti and Garang Canals.

34. These canals worked satisfactorily on the whole but the Garang gave trouble and had to be worked with " rotations " throughout the Abkalani.

Capital.—No expenditure was incurred under this head.

Extensions and Improvements.—An expenditure of Rs. 321 was incurred under this head during the year.

Maintenance and Repairs.—The canals were maintained in good order at a cost of Rs. 17,848 including work-charged establishment.

Irrigation.—The total area irrigated during the year was 16,162 acres, compared with 28,220 acres irrigated last year and 23,631 acres, the average of the past three years.

Financial Results.—The gross revenue amounted to Rs. 54,646, compared with Rs. 62,065 last year, and Rs. 70,740 the average of the past triennium. Deducting working expenses, viz. Rs. 26,682, the net revenue was Rs. 27,964. The decrease in the gross revenue this year was due to the decrease in the area of cultivation.

General Remarks.—The remissions granted amounted to Rs. 12,467 against Rs. 34,430 remitted last year.

The principal crops grown were :—

Jowari	.. .. ..	7,558 acres.
Wheat	.. .. ..	3,029 ,,

The value of the whole outturn is estimated at Rs. 1,28,959, or an average of Rs. 8 per acre.

Baghar Canal.

35. With the construction of the Head Regulator in 1927, it is now possible to control the water entering this canal. Until, however extensive improvements are carried out to the canal, a scheme for which has been prepared, it will not be possible to control the distribution of water or to prevent the flow to waste of a great part of it, into the sea. The canal flowed for 174 days. It worked as well as could be expected in the circumstances mentioned.

Capital.—No expenditure was incurred under this head during the year.

Extensions and Improvements.—A sum of Rs. 193 was spent under this head during the year.

Maintenance and Repairs.—The canal and its branches were maintained in good order at a cost of Rs. 39,075, including work-charged establishment.

Irrigation.—The total area irrigated during the year was 26,041 acres, of which 24,188 acres were under kharif and 1,853 acres under rabi, compared with 36,548 acres last year and 35,116 acres the average of the previous three years.

Financial Results.—The gross revenue amounted to Rs. 40,517, compared with Rs. 66,422 last year, and Rs. 78,149 the average of the

past triennium. Deducting working expenses, viz Rs. 52,551 the net revenue was minus Rs. 12,034.

General Remarks.—The remissions granted amounted to Rs. 30,232, compared with Rs. 29,178 remitted last year.

The principal crops grown were :—

Rice	21,441	acres.
Bajri	1,393	,,
Sugarcane	762	,,

The value of the whole outturn is estimated at Rs. 5,09,690, or an average of Rs. 20 per acre.

Indus Canals—Right Bank.

36. *Capital.*—No expenditure was incurred under this head during the year.

Extensions and Improvements.—No expenditure was incurred under this head.

Maintenance and Repairs.—The canals were maintained in good order at a cost of Rs. 16,692, including work-charged establishment.

Irrigation.—The total area irrigated during the year was 16,148 acres, of which 15,019 acres were under kharif and 1,129 acres under rabi, compared with 26,631 acres last year and 26,426 acres the average of the past three years.

Financial Results.—The gross revenue amounted to Rs. 32,521, compared with Rs. 37,466 last year, and Rs. 78,149 the average of the past three years. Deducting working expenses, viz Rs. 23,463 the net revenue was Rs. 9,058. The decrease in gross revenue was due to the smaller area of cultivation this year.

General Remarks.—The remissions granted amounted to Rs. 11,163, compared with Rs. 24,798 remitted last year.

The principal crops grown were :—

Rice	13,244	acres.
Bajri	1,016	,,

The value of the whole outturn is estimated at Rs. 3,01,830, or an average of Rs. 19 per acre.

Pinyari Canal.

37. This canal flowed for 177 days and worked very satisfactorily.

Capital.—No expenditure was incurred under this head during the year.

Extensions and Improvements.—A sum of Rs. 6,449 was spent under this head partly on a survey for the improvement of this system, and partly on certain minor works.

Maintenance and Repairs.—The canal and its branches were maintained in good order at a cost of Rs. 1,05,075, including work-charged establishment.

Irrigation.—The total area irrigated during the year was 1,00,062 acres, of which 84,106 acres was under kharif and 15,956 acres under rabi, compared with 96,820 acres last year, and 98,946 acres the average of the past three years.

Financial Results.—The gross revenue amounted to Rs. 2,40,754 compared with Rs. 1,85,273 last year, and Rs. 2,57,490 the average of the past three years. Deducting working expenses, viz. Rs. 1,60,731, the net revenue was Rs. 80,023. The increase in the gross revenue this year was due to an increase in the area of cultivation.

General Remarks.—The remissions granted amounted to Rs. 79,689, compared with Rs. 78,240 remitted last year.

The principal crops grown were :—

Rice	.. .. ..	82,154 acres.
Oil Seeds	.. .. ..	13,777 ,,

The value of the whole outturn is estimated at Rs. 34,93,005, or an average of Rs. 35 per acre.

Indus Canals—Left Bank.

38. *Capital.*—No expenditure was incurred under this head during the year.

Extensions and Improvements.—No expenditure was incurred under this head.

Maintenance and Repairs.—The canals were maintained in good order at a cost of Rs. 44,313, including work-charged establishment.

Irrigation.—The total area irrigated during the year was 37,154 acres, of which 36,013 acres were under kharif and 1,141 acres under rabi, compared with 43,229 acres irrigated last year, and 41,514 acres the average of the past three years.

Financial Results.—The gross revenue amounted to Rs. 93,591, compared with Rs. 80,510 last year, and Rs. 1,11,734 the average of the past three years. Deducting working expenses, viz Rs. 62,189, the net revenue was Rs. 31,402. The increase in the gross revenue this year was partly due to the increased area under cultivation and partly due to the smaller amount of remissions granted.

General Remarks.—The remissions given during the year amounted to Rs. 24,373, compared with Rs. 98,769 remitted last year.

The principal crops grown were :—

Rice	.. .. ..	34,955 acres.
Bajri	.. .. ..	933 ,,

The value of the whole outturn is estimated at Rs. 7,20,765, or an average of Rs. 19 per acre.

Sattah Canal.

39. This canal worked satisfactorily during the year. A project for remodelling and moduling the canal has lately been sanctioned.

Capital.—No expenditure was incurred under this head.

Extensions and Improvements.—No expenditure was incurred under this head.

Maintenance and Repairs.—The canal and its branches were maintained in good order at a cost of Rs. 7,864, including work-charged establishment.

Irrigation.—The total area irigated during he year was 15,464 acres, of which 15,315 acres were under kharif, and 149 acres under rabi, compared with 17,100 acres irrigated last year, and 15,788 acres the average of the past three years.

Financial Results.—The gross revenue amounted to Rs. 34,188 compared with Rs. 25,822 last year, and Rs. 38,337 the average of the past three years. Deducting working expenses, viz. Rs. 12,619, and the share due to old irrigation, viz. Rs. 6,927, the net revenue was Rs. 14,642. The increase in gross revenue this year, inspite of the decrease in the area under cultivation was due to saving in working expenses and the grant of less remissions.

General Remarks.—The remissions granted during the year amounted to Rs. 10,383, compared with Rs. 13,827 remitted last year.

The principal crops grown were :—

Rice	..	..	14,072 acres.
Bajri	..	..	1,114 ,,

The value of the whole outturn is estimated at Rs. 3,97,830, or an average of Rs. 26 per acre.

Western Nara including Pritchard.

40. A combined upstream feeder for the Western Nara and the Fordwah worked very well. There was the usual deficiency of water supply below mile 61 in Kakar and Mehar Talukas which was met by resorting to rotations. The supply was better this year than during the past 10 years due to the carrying out of certain minor improvements. The canal flowed for 147 days during the year.

Capital.—No expenditure was incurred under this head during the year.

Extensions and Improvements.—A sum of Rs. 230 was incurred under this head.

Maintenance and Repairs.—The canal and its branches were maintained in good order at a cost of Rs. 1,85,020, including work-charged establishment.

Irrigation.—The total area irrigated during the year was 332,566 acres, of which 207,896 acres were under kharif, and 124,670 acres under rabi,

compared with 354,452 acres last year, and 355,049 acres the average of the past 3 years.

Financial Results.—The gross revenue amounted to Rs. 8,45,262, compared with Rs. 7,02,432 last year, and Rs. 8,69,125 the average of the past three years. Deducting working expenses, viz. Rs. 2,84,841, the net revenue was Rs. 5,60,421. The increase in gross revenue this year, inspite of the decrease in the area under cultivation, was due to the smaller amount of remissions granted during the year.

General Remarks.—The remissions given amounted to Rs. 1,14,244, compared with an amount of Rs. 3,24,093 remitted last year.

The principal crops grown were :—

Rice	.. .. ..	174,020 acres.
Jowari	.. .. ..	29,751 ,,
Wheat	.. .. ..	20,550 ,,
Oil Seeds	.. .. ..	24,006 ,,

The value of the whole outturn is estimated at Rs. 44,09,147, or an average of Rs. 13 per acre.

Phitta Canal.

41. The canal takes off from a bye-river. It did not work satisfactorily and flowed for only 86 days during the year.

Capital.—No expenditure was incurred under this head during the year.

Extensions and Improvements.—No expenditure was incurred under this head during the year.

Maintenance and Repairs.—The canal was maintained in good order at a cost of Rs. 1,896, including work-charged establishment.

Irrigation.—The total area irrigated during the year was 3,704 acres, of which 2,463 acres were under kharif and 1,241 acres under rabi, compared with 6,210 acres last year, and 6,428 acres, the average of the past three years.

Financial Results.—The gross revenue amounted to Rs. 8,316, compared with Rs. 13,344 last year, and Rs. 14,238 the average of the previous three years. Deducting working expenses, viz. Rs. 2,854, the net revenue was Rs. 5,462.

General Remarks.—The remissions granted during the year amounted to Rs. 1,043, compared with Rs. 2,440 remitted last year.

The principal crops grown were :—

Jowari	.. .. ..	2,398 acres.
Wheat	.. .. ..	794 ,,

The value of the whole outturn is estimated at Rs. 48,758, or an average of Rs. 13 per acre.

MARVIWAH.

42. The canal worked satisfactorily this year, and flowed for 114 days.

Capital.—No expenditure was incurred under this head during the year.

Extensions and Improvements.—No expenditure was incurred under this head during the year.

Maintenance and Repairs.—The canal and its branches were maintained in good order at a cost of Rs. 2,612 including work-charged establishment.

Irrigation.—The total area irrigated during the year was 6,830 acres, of which 3,742 acres were under kharif and 3,088 acres under rabi, compared with 8,763 acres irrigated last year, and 7,607 acres the average of the previous three years.

Financial Results.—The gross revenue amounted to Rs. 15,354, compared with Rs. 17,497 last year, and Rs. 18,402 the average of the previous three years. Deducting working expenses, viz. Rs. 4,187, the net revenue was Rs. 11,167. The increase in the gross revenue during the year, inspite of the decrease in the area under cultivation, was due to the smaller amount of remissions granted.

General Remarks.—The remissions given amounted to Rs. 2,729, compared with an amount of Rs. 7,529 remitted last year.

The principal crops grown were :—

Rice	.. .. ..	3,160 acres.
Wheat	.. .. ..	651 ,,

The value of the whole outturn is estimated at Rs. 95,441, or an average of Rs. 14 per acre.

DADU CANALS.

43. *Capital.*—No expenditure was incurred under this head during the year.

Extensions and Improvements.—No expenditure was incurred under this head.

Maintenance and Repairs.—The canals and their branches were maintained in good order at a cost of Rs. 4,536, including work-charged establishment.

Irrigation.—The total area irrigated during the year was 14,409 acres, of which 10,192 acres were under kharif, and 4,217 acres under rabi, against 15,114 acres irrigated last year, and 13,425 acres the average of the past three years.

Financial Results.—The gross revenue amounted to Rs. 30,769, compared with Rs. 21,370 last year, and Rs. 28,597 the average of the previous three years. Deducting working expenses, viz. Rs. 7,556, the net revenue was Rs. 23,213. The increase in the gross revenue during the year, in spite of the decrease in the area under cultivation, was due to the smaller amount of remission granted during the year.

General Remarks.—The remissions given amounted to Rs. 5,153, compared with Rs. 18,300 remitted last year.

The principal crops grown were :—

Rice	.. .. ..	7,302 acres.
Jowari	.. .. ..	2,809 ,,
Wheat	.. .. ..	488 ,,

The value of the whole outturn is estimated at Rs. 2,52,776 or an average of Rs. 18 per acre.

(2) UNPRODUCTIVE.

Mahiwah.

44. The mouth of the Gudu Dhandh the feeder channel of the Mahiwah system, silted up considerably at the commencement of the season due to erosion. An emergency feeder was therefore excavated and the canal consequently flowed for 122 days during this year against the 105 days of flow last year.

Capital.—No expenditure was incurred under this head.

Extensions and Improvements.—No expenditure was incurred under this head.

Maintenance and Repairs.—The canal and its branches were maintained in good order at a cost of Rs. 96,812, including work-charged establishment.

Irrigation.—The total area irrigated during the year was 62,735 acres, of which 45,166 acres were under kharif, and 17,569 acres under rabi, compared with 67,154 acres last year, and 80,271 acres the average of the past three years.

Financial Results.—The gross revenue amounted to Rs. 1,32,190, compared with Rs. 95,331 last year, and Rs. 165,777 the average of the previous three years. Deducting the working expenses, viz. Rs. 1,48,696, and the share due to old irrigation Rs. 89,217, the net revenue was minus Rs. 1,05,723.

General Remarks.—The remissions granted amounted to Rs. 24,404 compared with an amount of Rs. 61,902 remitted last year.

The principal crops grown were :—

Rice	.. .. ..	7,974 acres.
Jowari	.. .. ..	26,800 ,,
Bajri	.. .. ..	7,801 ,,
Wheat	.. .. ..	7,668 ,,

The value of the whole outturn is estimated at Rs. 5,01,651, or an average of Rs. 8 per acre.

Kalri Canal.

45. The canal worked satisfactorily and flowed for 129 days during the year.

To bring the unoccupied area of land along this canal system under cultivation, and to safeguard its interests in the event of a possible lowering of the river water levels occurring owing to the opening of the Barrage canals, the whole system is being remodelled.

Capital.—A sum of Rs. 2,84,369 was incurred under this head during the year on remodelling the Kalri and Narichach Canals.

Extensions and Improvements.—No expenditure was incurred under this head.

Maintenance and Repairs.—The canal and its branches were maintained in good order at a cost of Rs. 28,369, including work-charged establishment.

Irrigation.—The total area irrigated was 13,668 acres, of which 10,888 acres were under kharif, and 2,780 acres under rabi, compared with 12,767 acres last year, and 15,405 acres the average of the past three years.

Financial Results.—The gross revenue amounted to Rs. 32,300 compared with Rs. 23,355 last year, and Rs. 39,836 the average of the past three years. Deducting the working expenses, viz. Rs. 42,807, the loss on the canal was Rs. 10,507 during the year.

General Remarks.—The remissions granted amounted to Rs. 7,913 compared with Rs. 72,200 remitted last year.

The principal crops grown were :—

Rice	.. ..	8,127 acres.
Jowari	.. ..	1,359 ,,

The value of the whole outturn is estimated at Rs. 2,32,130, or an average of Rs. 17 per acre.

(b) Works for which Capital Accounts are not kept.

Canals.

46. The following canals, which were formerly classed under "15-Works for which only Revenue Accounts are kept" have been reclassified under the head "15-Works for which neither Capital nor Revenue Accounts are kept" :—

(1) New Feeder to Western Nara.

(2) Aral.

(3) Manchar.

(4) Wahurwah.

(5) Canals north of Kotri.

River Bunds.

47. The principal river bunds are the Kashmore Bund System, the Sukkur-Begari Bund System, the Ghar and the Western Nara Bunds, Bunds north of Kotri, the Right and Left Banks' bunds in the Karachi Canals Division, and Bunds in the Rohri Sub-Division of the Shikarpur Canals Division.

In the Begari Canals Division, the bund line was held intact. Two additional sets of engines and pumps were purchased during the year for wetting the bunds as the existing five sets were not sufficient to deal with the whole system.

In the Shikarpur Canals Division, the Sukkur-Begari and other Bunds were maintained in good order, and stood the test well.

In the Ghar Canals Division, the Bunds stood very well.

In the Western Nara Division, there was great pressure of water, particularly in the dangerous portion near Talti where the water level was even higher than the 1929 level. The two leaks which occurred in miles 92 and 96 were closed immediately.

In the Karachi Canals Division, the bund lines on the left and right banks of the river stood the pressure well and no breaches occurred.

48. *Extensions and Improvements.*—A sum of Rs. 2,75,690 was spent under this head, mainly on the following works :—

(1) Constructing a trenching bund to Arain Loop.

(2) Raising and strengthening the old Kasimpur Bund.

(3) Proposed extension of the Kasimpur Bund, mile 5/2 to 17 of Koraiwah.

(4) Raising the Sukkur-Begari Bund to give a free-board of 4 feet above the H. F. L. of 1929.

(5) Raising the river bunds on the left bank to give a free-board of 4 feet above the H. F. L.

(6) Raising and strengthening the Adurtakio Loop from mile 0/0 to mile 5/0 in order to obtain a free-board of 4 feet above the H. F. L. of 1929.

Maintenance and Repairs.—All the Bunds in the Circle were maintained in good order at a cost of Rs. 7,50,652 including work-charged establishment. Of this amount Rs. 1,34,855 were spent in the Begari Canals Division, Rs. 2,35,570 in the Shikarpur Canals Division, Rs. 31,525 in the Ghar Canals Division, Rs. 1,20,256 in the Western Nara Division and Rs. 2,28,446 in the Karachi Canals Division.

Irrigation and Financial Results.—The areas irrigated by canals ex : the Kashmore Bund System and Bunds in the Shikarpur Canals, Ghar Canals, Western Nara and Karachi Canals Divisions were 4,844, 5,038, 409, 2,362 and 9,281 acres respectively, while the revenue therefrom amounted to Rs. 10,717, Rs. 19,910, Rs. 356, Rs. 14,790 and Rs. 29,079 respectively.

General Remarks.—The remissions granted during the year amounted to Rs. 13,440 compared with an amount of Rs. 48,866 remitted last year.

49. *Expenditure and Receipts from gardens.*—The expenditure on, and receipts from, gardens, during the year, are compared below with the figures of the previous three years :—

Year		Expenditure on the maintenance of gardens during the year.	Receipts during the year.
		Rs.	Rs.
1928–29	..	8,745	1,240
1929–30	..	7,057	524
1930–31	..	7,304	846
1931–32	..	7,369	2,737

50. *Plantations.*—The total number of trees planted during the year was 19,766, of which 6,716 were talli, 6,619 babul, and the rest chiefly nim. The total number of trees alive at the end of the year was 352,149.

4. INDUS LEFT BANK CIRCLE.

A. GENERAL REVIEW OF THE RESULTS OF THE YEAR 1931-32.

Area of cultivation, Government and Jagir.

51. The gross assessed areas for the year are given in the subjoined statement A :—

Statement A.

Year and class of crop.	55—Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue. A—Irrigation Works.			15—Other Revenue expenditure financed from ordinary Revenues. A—Irrigation Works for which neither Capital nor Revenue accounts are kept.	Grand total.
	Productive.	Unproductive.	Total.		
1	2	3	4	5	6
	Acres.	Acres.	Acres.	Acres.	Acres.
Average for three years including 1930-31. Kharif..	664,108	613,356	1,277,464	13,722	1,291,186
Rabi ..	117,542	94,784	212,326	4,555	216,881
Total ..	781,650	708,140	1,489,790	18,277	1,508,067

Statement A—contd.

Year and class of crops.		55—Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue. A-Irrigation Works.			15—Other Revenue expenditure financed from ordinary Revenues A—Irrigation Works for which neither Capital nor Revenue accounts are kept.	Grand total.
		Productive.	Unproductive.	Total		
1		2	3	4	5	6
		Acres.	Acres.	Acres.	Acres.	Acres.
1930-31 ..	Kharif	637,870	596,083	1,233,953	13,593	1,247,546
	Rabi ..	121,229	122,628	243,857	3,938	247,795
	Total ..	759,099	718,711	1,477,810	17,531	1,495,341
1931-32 ..	Kharif	584,645	570,332	1,154,977	13,709	1,168,686
	Rabi ..	108,383	158,787	267,170	1,075	268,245
	Total ..	693,028	729,119	1,422,147	14,784	1,436,931
Increase or decrease as compared with the average.	Kharif	—79,463	—43,024	—122,487	—13	—122,500
	Rabi ..	—9,159	—64,003	54,844	—3,480	51,364
	Total ..	—88,622	20,979	—67,643	—3,493	—71,136
Increase or decrease as compared with 1930-31.	Kharif	—53,225	—25,751	—78,976	116	—78,860
	Rabi ..	—12,846	36,159	23,313	—2,863	20,450
	Total ..	—66,071	10,408	—55,663	—2,747	—58,410

The total cultivation shows a decrease of 71,136 acres and 58,410 acres respectively when compared with the figures of average cultivation for the last three years and with those of last year. The areas under *kharif* and *rabi* show a decrease of 78,860 acres and an increase of 20,450 acres, respectively, when compared with the figures for last year, and a decrease of 122,500 acres and an increase of 51,364 acres, respectively, when compared with those of the last triennium.

52. The area of dubari (twice cropped land) which is not included in statement (A) was 47,762 acres, of which 13,601 acres were watered dubari in the Thar Parkar District. The dubari figures for the previous year and the average figures for the previous three years were 57,236 acres and 68,054 acres respectively while those of watered dubari were 8,308 acres and 11,809 acres respectively.

Irrigation Assessment, Government and Jagir.

53. The net irrigation assessment for the year, including "Hakabo" for Jagir lands, is given in the subjoined statement B :—

Statement B.

Year and class of crop.		55—Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue. A—Irrigation Works.			15—Other Revenue expenditure financed from ordinary Revenues. A—Irrigation Works for which neither Capital nor Revenue accounts are kept.	Grand total.
		Productive.	Unproductive.	Total.		
1		2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.	Rs.
Average of three years including 1930-31.	Kharif..	15,35,634	13,58,224	28,93,858	25,522	29,19,380
	Rabi ..	2,17,947	3,45,349	5,63,296	13,384	5,76,680
	Total ..	17,53,581	17,03,573	34,57,154	38,906	34,96,060
1930-31 ..	Kharif..	13,95,257	11,92,896	25,88,153	17,647	26,05,800
	Rabi ..	1,93,189	2,71,400	4,64,589	8,409	4,72,998
	Total ..	15,88,446	14,64,296	30,52,742	26,056	30,78,798

Statement B—contd.

Year and class of crop.		55—Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue. A—Irrigation Works.			15—Other Revenue expenditure financed from ordinary Revenues. A—Irrigation Works for which neither Capital nor Revenue accounts are kept.	Grand total.
		Productive.	Unproductive.	Total.		
1		2	3	4	5	6
		Rs.	Rs.	Rs.	Rs.	Rs.
1931-32 ..	Kharif ..	15,36,441	15,39,984	30,76,425	30,959	31,07,384
	Rabi ..	2,02,126	4,24,455	6,26,581	2,396	6,28,977
	Total ..	17,38,567	19,64,439	37,03,006	33,355	37,36,361
Increase or decrease compared with the average.	Kharif ..	807	1,81,760	1,82,567	5,437	1,88,004
	Rabi ..	—15,821	79,106	63,285	—10,988	52,297
	Total ..	—15,014	2,60,866	2,45,852	—5,551	2,40,301
Increase or decrease as compared with the year 1930-31.	Kharif ..	1,41,184	3,47,088	4,88,272	13,312	5,01,584
	Rabi ..	8,937	1,53,055	1,61,992	—6,013	1,55,979
	Total ..	1,50,121	5,00,143	6,50,264	7,299	6,57,563

The net assessed Revenue shows an increase of Rs. 6,57,563 as compared with that of the previous year, and Rs. 2,40,301 when compared with the average of the previous three years.

Cultivation on river spill.

54. The area cultivated on spill water was 17 acres, as compared with 3 acres in the previous year, and 5,444 acres the average of the previous three years.

55. The average net consolidated assessment per acre on Government land for the year under report compared with that of the previous year, and the average of the previous three years, is shown below :—

Assessment rates per acre on Government land.

—	Average of previous three years.	1931-32	1930-31
	Rs.	Rs.	Rs.
55—*Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue*—			
1. Productive	2·46	2·75	2·29
2. Unproductive	2·39	2·74	2·07
15—*Other Revenue Expenditure financed from Ordinary Revenue.*			
Works for which neither Capital nor Revenue Accounts are kept	2·17	2·27	1·50
Average for all works ..	2·76	2·73	2·20

56. The following statement shows the realizations under all heads, and the balance outstanding at the end of the year :—

Actual realizations under all heads and the balance outstanding.

Statement C.

Years.	Collections.			Total receipts.	Balance outstanding.
	Government land and Hakabo.	Miscellaneous.	Four per cent. irrigation share of proceeds from sale of occupancy rights.		
1	2	3	4	5	6
	Rs.	Rs.	Rs.	Rs.	Rs.
Average of past three years.	28,72,678	1,09,133	1,63,771	31,45,582	5,37,732
1930-31	23,86,491	81,125	1,68,201	26,35,817	9,49,453
1931-32	35,08,101	80,831	1,81,031	37,69,963	7,02,443
Increase or decrease as compared with 1930-31.	11,21,610	—294	12,830	11,34,146	—2,47,010
Increase or decrease as compared with average of three years ..	6,35,423	—28,302	17,260	6,24,381	1,64,711

The balance outstanding at the end of the year, viz. Rs. 7,02,443, was Rs. 2,47,010 less than that of the previous year, and Rs. 1,64,711 more than the average of the previous three years, respectively.

Remission on Government land.

57. The remissions granted during the year, on Government land, amounted to Rs. 6,43,232 against the amount of Rs. 14,27,978 remitted last year, and Rs. 10,44,831, the average amount for the previous three years.

The following statement gives details of the causes of remissions and compares the results of the year under report with those of the previous year :—

Causes of remissions.	1930-31.	1931-32.	Difference.
	Rs.	Rs.	Rs.
Deficiency of water and draught	2,24,916	1,82,788	— 42,128
Breaches of Canals	60,091	22,465	— 37,626
Floods and erosion	917	1,479	562
Kalar soil	36	137	101
Grants cancelled and arrears	74	....	— 74
Locusts	2,379	756	— 1,623
Blights or Mahlo	11,672	4,832	— 6,840
Insects or wire worms	1,58,459	83,766	— 74,693
Written off	364	186	— 178
Frost	9,774	4,837	— 4,937
Rats	920	1,465	545
Special remissions	9,54,312	3,37,842	—6,16,470
Other causes	4,064	2,679	— 1,385
Total ..	14,27,978	6,43,232	—7,84,746

Remission on Jagir lands.

58. The remission granted during the year, on Jagir lands, amounted to Rs. 4, compared with Rs. 11,766, during the previous year. The remission was granted in the Hyderabad Collectorate.

Loss to Canals by Jagir lands.

59. The difference between hakabo, or water rate assessed on the Jagir cultivation, and the assessment at full rates, on these areas, is Rs. 2,39,900.

Expenditure on maintenance and repairs and establishments charged to Revenue.

60. The total charges during the year on account of the maintenance and repairs amounted to Rs. 19,19,366, as shown below :—

	Rs.
Works	12,49,179
Establishment and Tools and Plant	4,66,396
Percentage charges for Revenue collection ..	2,03,791
Total ..	19,19,366

The expenditure on establishment charged to works amounted to Rs. 4,49,362 while the net expenditure on "works " (clearance and repairs) was Rs. 7,99,817. As compared with the previous year and the average of the previous three years, the net expenditure on clearance and repairs shows a decrease of Rs. 2,35,501, and an increase of Rs: 3,76,448, respectively.

Expenditure on maintenance and repairs separately for canals and river embankments.

61. Of the total charges shown in the preceding paragraph the amount spent on canals, including the cost of surveys for special canal projects was Rs. 17,67,123 and on the river embankments Rs. 1,52,243. The expenditure on the Indus River Gauging Division was Rs. 51,895.

Outlay on new works.

62. The outlay for the year on new works was :—

55-*Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue.*

		Rs.
Productive ..	Capital	7,93,606
	Revenue	13,467
Unproductive ..	Capital	....
	Revenue	1,113

15-*Other Revenue expenditure financed from ordinary Revenues—Works for which neither Capital nor Revenue accounts are kept.*

Revenue	2,16,865
Total ..	10,25,051

Financial results.

63. The General Financial Results of all the irrigation works in this Circle are shown in the following statement.

Statement D.

Class of Works	Gross Revenue	Working Expenses	Net Revenue	Simple Interest.	Net Profit, 1931-32.	Net Profit, 1930-31.	Increase.	Decrease.
1	2	3	4	5	6	7	8	9
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
55-*Construction of Irrigation, Navigation, Embankment and Drainage Works not charged to Revenue*—								
1. Productive ..	17,12,960	6,11,656	11,01,304	2,95,256	8,06,048	4,30,406	3,75,642	..
2. Unproductive.	20,27,641	11,64,421	8,63,220	8,47,296	15,924	—8,35,443	8,51,367	..
Total ..	37,40,601	17,76,077	19,64,524	11,42,552	8,21,972	—4,05,037	12,27,009	..
15-*Other Revenue Expenditure financed from Ordinary Revenues Works for which neither Capital nor Revenue accounts are kept*—								
3. Miscellaneous.	5,42,665	3,85,677	1,56,988	..	1,56,988	—5,50,202	7,07,190	..
1931-32 ..	42,83,266	21,61,754	21,21,512	11,42,552	9,78,960	—9,55,239	19,34,199	..
1930-31 ..	26,41,827	25,26,634	1,15,193	10,70,432	....	....	..	..
Increase or decrease ..	16,41,439	—3,64,880	20,06,319	72,120	19,34,199		..	..

64. The following statement shows the expenditure per acre of area irrigated, under all classes of works excluding the cost of the surveys for definite projects :—

Statement E.

Total area irrigated by all classes of works.	Total working expenses and maintenance of canals.	Rate of working expenses per acre of area irrigated (Column 2 divided by Column 1).	Expenditure on agricultural works for which neither Capital nor Revenue accounts are kept (excluding the cost of surveys for special projects).	Rate of expenditure on agricultural works for which neither Capital nor Revenue accounts are kept, per acre of area irrigated (Column 4 divided by Column 1).	Total working expenses per acre of area irrigated including expenditure on works for which neither Capital nor Revenue accounts are kept (Column 3 *plus* 5).
1	2	3	4	5	6
Acres.	Rs.	Rs.	Rs.	Rs.	Rs.
1,436,931	17,76,077	1·24	3,85,677	·27	·151

The total working expenses, including expenditure on works for which neither Capital nor Revenue accounts are kept, were Rs. 1·51 per acre of the total area irrigated, as compared with Rs. 1·68 per acre in the previous year, and Rs. 1·80 the average rate during the past three years.

Lengths of Canals and Bunds.

65. There were 1,289 miles of main canals, and 3,382 miles of branch canals, in operation during the year, against the previous year's total mileage of 4,417 miles, (Main canals 1,270 miles and branch canals 3,147 miles). The total length of River Embankments maintained was 337 miles, compared with 421 miles last year.

Areas of principal crops, Government and Jagir.

66. The area of principal crops grown during the year were :—

Statement F.

Crops.	1931-32 Lift.	1931-32 Flow.	1931-32 Total.	Average of previous three years.	1930-31.	Increase or decrease as compared with previous three years.	Increase or decrease as compared with 1930-31.
1	2	3	4	5	6	7	8
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Kharif — Rice ..	680	363,051	363,731	364,019	387,076	— 288	—23,345
Kharif — Jowari ..	62,638	61,772	124,410	147,437	146,141	—23,027	—21,731
Kharif — Bajri ..	250,755	119,994	370,749	397,395	382,298	—26,646	—11,549
Kharif — Cotton ..	97,778	155,191	252,969	327,589	279,039	—74,620	—26,070
Kharif — Sugar cane ..	816	1,198	2,014	....	....	2,014	2,014
Kharif — Other crops	20,899	33,888	54,787	54,085	52,992	702	1,795
Kharif — Total ..	433,566	735,094	1,168,660	1,290,525	1,247,546	—121,865	—78,886
Rabi — Wheat ..	17,018	179,323	196,341	145,991	169,824	50,350	26,517
Rabi — Barley ..	88	2,070	2,158	3,148	2,906	— 990	— 748
Rabi — Oil seeds ..	962	47,508	48,470	68,613	64,943	—20,143	—16,473
Rabi — Other crops	2,294	66,354	68,648	67,181	67,358	1,467	1,290
Rabi — Total ..	20,362	295,255	315,617	284,933	305,031	30,684	10,586
Grand Total ..	453,928	1,030,349	1,484,277	1,575,458	1,552,577	—91,181	—68,300

As compared with last year and the average of the previous triennium, there is a decrease of 78,886 and 121,865 acres, respectively, under *kharif* and an increase of 10,586 and 30,684 acres, respectively, under *rabi*.

Percentage of Kharif and Rabi.

67. The percentages of *kharif* and *rabi* areas irrigated in the Circle were 79 and 21, against 80 and 20 last year. The highest *kharif* percentage was 91 and was obtained in the Nasrat Canals Division, while the lowest, viz. 63, occurred in the Jamrao Canal Division, and the Hyderabad Canals,

Fuleli Canals, and Eastern Nara Divisions had 87, 78, and 77 per cent. *kharif*, respectively, during the year.

The Fuleli Canals and the Eastern Nara Divisions had the largest rice areas, viz. 253,676 and 69,824 acres, respectively, out of the total rice cultivation of 363,731 acres for this Circle.

The largest areas under bajri were in the Hyderabad Canals and Eastern Nara Divisions viz. 128,195 and 73,874 acres, respectively, the Fuleli, Nasrat and Jamrao Canals Divisions recording 62,209, 54,917 and 51,554 acres, respectively.

The largest area under jowari viz. 99,982 acres was obtained in the Nasrat Canals Division.

The total area under cotton in the Circle was 252,969 acres, that on the Jamrao Canal and Eastern Nara being 102,063 and 47,016 acres, respectively. The Hyderabad, Nasrat, and Fuleli Canals Divisions had 51,109, 36,296, and 16,485 acres, respectively.

The largest area of wheat occurred on the Jamrao Canal, and amounted to 85,012 acres, out of the total of 196,341 acres for the whole Circle; Eastern Nara Division recorded 46,875, Fuleli Canals Division 42,566, and Nasrat Canals Division 13,229 acres, respectively. The smallest area of wheat viz. 8,659 acres was in the Hyderabad Canals Division.

The largest area under oil seeds viz. 31,696 acres occurred in the Fuleli Canals Division, out of the total for the Circle of 48,470 acres; the Nasrat Canals Division recording the lowest, viz. 2,890 acres.

Out of the total area cultivated during the year 30 per cent. was watered by lift and 70 per cent. by flow against 36 and 64 per cent. respectively, during last year.

68. The duties and the deltas of canals in this Circle show the usual fluctuations as shown in the subjoined statement :—

Name of Canal.	Year under report.		Last year.		Remarks.
	Duty.	Delta.	Duty.	Delta.	
1	2	3	4	5	6
(i) *Nasrat Canals Division.*					
Dad Canal including Ren Distributary.	33	6·0	44	5·0	
Nasrat Canal ..	51	4·7	57	4·3	
Naulakhi Canal ..	34	7·1	36	6·2	
Dambhro Canal ..	25	7·5	45	4·6	
Mahrabwah ..	65	3·6	26	8·6	

Name of Canal.	Year under report.		Last year.		Remarks.
	Duty.	Delta.	Duty.	Delta.	
1	2	3	4	5	6
(ii) Hyderabad Canals Division.					
Ali Bahar Kacheri ..	64	3·0	73	4·4	
Great Marakh ..	65	4·09	62	5·5	
Sarfraz Wah ..	61	3·9	37	8·2	
Gharo Mahmudo ..	92	2·02	85	3·3	
Kari Shumali ..	76	3·6	30	15·9	
Nasir Wah ..	49	4·5	38	8·2	
(iii) Fuleli Canals Division.					
Fuleli Canal—					
Kharif ..	46	7·8	44	8·0	
Rabi ..	63	5·8	67	5·0	
Hassanali Canal ..	30	8·5	25	11·0	
(iv) Jamrao Canal Division.					
Jamrao Canal—					
Kharif ..	78	5·5	85	5·5	
Rabi ..	58	5·2	94	2·6	
(v) Eastern Nara Division.					
Mitharao Canal—					
Kharif ..	52	6·5	55	6·0	
Rabi ..	47	5·8	41	4·3	
Hiral Canal ..	50	7·5	82	4·0	
Thar Canal ..	26	14·6	38	8·7	
Khipro Canal ..	49	7·5	46	6·9	

Incidence of Working Expenses.

69. On "Productive Works" the incidence of working expenses on assessed revenue, and per acre irrigated, were 35·1 per cent. and Rs. 0·73 per acre, respectively, as compared with 41·85 per cent. and Rs. 0·86 per acre in the previous year, that on "Unproductive Works" being 53·5 per cent. and Rs. 1·42 per acre.

70. The total value of crops grown in the irrigated area of 1,484,277 acres, as estimated by the Revenue authorities, is Rs. 3,05,31,958, which gives an average rate of Rs. 20·6 per acre.

Value of each kind of crop irrigated.

B.—DETAILS OF DIFFERENT WORKS OR GROUP OF WORKS, A COMPARISON OF AGRICULTURAL AND FINANCIAL RESULTS OF THE YEAR 1931-32 WITH THOSE OF THE PREVIOUS YEAR, AND THE AVERAGE OF THE PREVIOUS THREE YEARS, AND THE MAIN CAUSES OF ANY IMPORTANT DIFFERENCES IN THE RESULTS.

(a) Works for which capital accounts are kept.

(I) PRODUCTIVE.

ALIBAHAR KACHERI.

71. The canal flowed for 96 days during the year and worked very satisfactorily.

Capital. No expenditure was incurred on any works charged to Capital.

Extensions and Improvements. No expenditure was incurred during the year under report.

Maintenance and Repairs. The canal and its branches were maintained in good order at a cost of Rs. 5,317, including the work-charged establishment.

Irrigation. The area irrigated during the year was 10,438 acres, (kharif 10,166 acres and rabi 272 acres), against 13,947 acres, (kharif 11,367 acres and rabi 2,580 acres), irrigated in the previous year, and 14,930 acres the average of the previous three years.

Financial Results. The gross revenue amounted to Rs. 22,923, against Rs. 20,321 last year, and Rs. 25,882 the average of the previous three years. Deducting working expenses viz. Rs. 8,809, and the share due to old irrigation viz. Rs. 8,239, the net revenue was Rs. 5,875.

General Remarks. The sum remitted during the year was Rs. 5,019 against Rs. 6,612 remitted last year.

The principal crops grown were :—

Bajri ..	..	.. 7,108 acres.
Cotton..	..	.. 1,606 ,,
Oil Seeds	..	.. 108 ,,

and the value of the whole outturn is estimated at Rs. 2,15,867, or Rs. 21 per acre.

Great Marakh System.

72. The canal worked very satisfactorily and was in flow for 133 days.

Capital. No expenditure was incurred during the year under report.

Extensions and Improvements. An expenditure of Rs. 54 was incurred on this head during the year under report.

Maintenance and Repairs. The canal and its branches were maintained in good order at a cost of Rs. 28,130, including work-charged establishment.

Irrigation. The area irrigated during the year was 75,684 acres, (kharif 59,774 acres and rabi 15,910 acres), against 84,247 acres, (kharif 67,857 acres and rabi 16,390 acres), irrigated in the previous year and 87,167 acres the average of the previous three years.

Financial Results. The gross revenue amounted to Rs. 1,84,298, against Rs. 1,55,317 last year and Rs. 1,53,442 the average of previous three years. Deducting working expenses, viz. Rs. 49,076 and the share due to old irrigation, viz. Rs. 36,032, the net revenue was Rs. 99,190.

General Remarks. The remission granted during the year amounted to Rs. 9,626, against Rs. 31,159 for last year.

The principal crops grown were :—

Rice	.. 13,746 acres.
Bajri	.. 29,539 ,,
Cotton ..	.. 12,654 ,,
Wheat ..	.. 2,109 ,,
Oil Seeds ..	.. 3,647 ,,
Other crops ..	.. 10,154 ,,

and the value of the whole outturn is estimated at Rs. 16,39,650, or Rs. 22 per acre.

Sarfraz System.

73. The canal flowed for 120 days and worked very satisfactorily.

Capital. No expenditure was incurred during the year under report.

Extensions and Improvements. No expenditure was incurred during the year under report.

Maintenance and Repairs. The canal and its branches were maintained in good order at a cost of Rs. 11,583, including work-charged establishment.

Irrigation. The area irrigated during the year was 22,300 acres (kharif 21,371 acres and rabi 929 acres), against 27,442 acres, (kharif 24,791 acres and rabi 2,651 acres), irrigated last year and 26,341 acres the average of the previous three years.

Financial Results. The gross revenue amounted to Rs. 54,182, against Rs. 41,807 last year and Rs. 45,717 the average revenue of the previous three years. Deducting working expenses, viz. Rs. 18,641, and the share due to old irrigation, viz. Rs. 10,985, the net revenue was Rs. 24,556.

General Remarks. The sum remitted during the year was Rs. 1,650, against Rs. 9,169 remitted last year.

The principal crops grown were :—

Bajri	..	.. 14,507 acres.
Cotton	..	.. 4,711 ,,

and the value of the whole outturn was Rs. 5,26,823, or Rs. 24 per acre, as estimated by the Revenue authorities.

Gharo Mahmudo System.

74. The canal worked satisfactorily and was in flow for 93 days.

Capital. No expenditure was incurred on this head during the year under report.

Extensions and Improvements. An expenditure of Rs. 1,001 was incurred on this head during the year under report.

Maintenance and Repairs. The canal and its branches were maintained at a cost of Rs. 30,197, including the work-charged establishment.

Irrigation. The area irrigated during the year was 69,375 acres, (kharif 61,420 acres and rabi 7,955 acres), against 78,651 acres, (kharif 66,257 acres and rabi 12,394 acres), irrigated last year and 83,334 acres the average of the previous three years.

Financial Results. The gross revenue amounted to Rs. 1,53,466, against Rs. 1,28,132 last year and Rs. 1,38,782 the average of the past triennium. Deducting working expenses, viz. Rs. 48,649, the net revenue comes to Rs. 1,04,817.

General Remarks. The sum remitted during the year was Rs. 5,137, against Rs. 27,685 for last year.

The principal crops grown were :—

Bajri	..	.. 37,368 acres.
Cotton	..	.. 18,293 ,,
Wheat	..	.. 2,408 ,,
Other Crops	..	.. 4,885 ,,

and the value of the whole outturn was Rs. 15,74,252, or Rs. 23 per acre, as estimated by the Revenue authorities.

KARI SHUMALI.

75. The canal was in flow for 137 days during the year and worked very satisfactorily.

Capital. No expenditure was incurred on any works charged to " Capital ".

Extensions and Improvements. No expenditure was incurred on this head during the year under Report.

Maintenance and Repairs. The canal and its branches were maintained in good order, at a cost of Rs. 12,661, including the work-charged establishment.

Irrigation. The area irrigated during the year was 32,387 acres, (kharif 27,934 acres and rabi 4,453 acres), against 37,837 acres, (kharif 31,489 acres and rabi 6,348 acres), of last year and 39,913 acres the average of the previous triennium.

Financial Results. The gross revenue amounted to Rs. 71,634, against Rs. 55,799 last year and Rs. 63,894 the average of the previous three years. Deducting working expenses, viz. Rs. 20,047, the net revenue comes to Rs. 51,587.

General Remarks. The sum remitted during the year was Rs. 5,309, against Rs. 12,608 for the last year.

The principal crops grown were :—

Bajri	..	.. 19,074 acres.
Cotton	..	.. 7,254 ,,
Wheat	..	.. 2,588 ,,

and the value of the whole outturn, as estimated by the Revenue Department, was Rs. 6,50,737, or Rs. 20 per acre.

NASIRWAH SYSTEM.

76. The canal worked very satisfactorily and was in flow for 111 days.

Capital. No expenditure was incurred on any work charged to " Capital ".

Extensions and Improvements. No expenditure was incurred on this head during the year under report.

Maintenance and Repairs. The canal and its branches were maintained in good order at a cost of Rs. 14,406 including the work-charged establishment.

Irrigation. The area irrigated during the year was 25,430 acres, (kharif 23,312 acres and rabi 2,118 acres), against 32,428 acres (kharif 26,136 acres and rabi 6,292 acres), irrigated during last year and 32,310 acres the average of the past three years.

Financial Results. The gross revenue amounted to Rs. 63,246, against Rs. 59,595 last year and Rs. 63,288 the average of the past triennium. Deducting working expenses, viz. Rs. 21,920, the net revenue comes to Rs. 41,326.

General Remarks. The sum remitted during the year was Rs. 3,419 against Rs. 12,939 for last year.

The principal crops grown were :—

Bajri	..	.. 15,111 acres.
Cotton	..	.. 6,576 ,,

and the value of the whole outturn was Rs. 5,77,971, or Rs. 23 per acre, as estimated by the Revenue Authorities.

Fuleli Canal System.

77. The canal worked satisfactorily on the whole. Rotations were resorted to at the close of the season when there was deficiency in the water supply. The canal was in flow for 183 days during the year.

Capital. The capital expenditure on the canal was Rs. 6,39,615 during the year.

Extensions and Improvements. A sum of Rs. 3,912 was spent under this head during the year under report.

Maintenance and Repairs. The canal and its branches were maintained in good order at a cost of Rs. 2,08,957, inclusive of work-charged establishment.

Irrigation. The area irrigated during the year was 403,553 acres (kharif 310,017 acres and rabi 93,536 acres), as compared with 413,580 acres, (kharif 334,077 acres and rabi 79,503 acres), irrigated in the previous year and 429,967 acres the average of the previous triennium.

Financial Results. The gross revenue amounted to Rs. 9,48,609, against Rs. 7,21,656 in the previous year and Rs. 8,88,705 the average of the previous three years. Deducting Rs. 2,34,195 for working expenses and Rs. 1,28,188 for the share due to old irrigation, the net revenue was Rs. 5,86,226.

General Remarks. The remission granted during the year amounted to Rs. 1,73,931, against Rs. 3,26,276 remitted last year.

The principal crops grown were :—

Rice	..	.. 228,398 acres.
Bajri	..	.. 52,474 ,,
Cotton	..	.. 16,140 ,,
Wheat	..	.. 41,486 ,,
Oil Seeds	..	.. 30,063 ,,
Other crops	..	.. 20,426 ,,

and the estimated value of the whole outturn was Rs. 87,22,859, or Rs. 22 per acre.

Other canals in Fuleli Canals Division.

78. The canals in the Hyderabad and Guni Katiar Sub-Divisions worked well during the year under report.

Capital. No expenditure was incurred under this head.

Extensions and Improvements. No expenditure was incurred during the year under this head.

Maintenance and Repairs. The canals and branches were maintained in good order at a cost of Rs. 32,546 including work-charged establishment.

The area irrigated during the year was 21,335 acres, (kharif 18,734 acres and rabi 2,601 acres), against 25,778 acres, (kharif 22,249 acres and rabi 3,529 acres), irrigated during last year and 28,262 acres the average of the previous three years.

Financial Results. The gross revenue amounted to Rs. 52,668, as compared with Rs. 38,062 last year and Rs. 56,562 the average of the previous three years. Deducting working expenses, viz. Rs. 44,723, the net revenue was Rs. 7,945.

General Remarks. The remissions granted during the year amounted to Rs. 7,028, against Rs. 17,385 last year.

The principal crops grown were :—

Rice	.. ..	11,144 acres.
Bajri	.. ..	6,849 ,,
Wheat	.. ..	1,031 ,,

and the estimated value of the whole outturn was Rs. 4,90,714, or Rs. 23 per acre.

Naulakhi Canal System.

79. The canal was in flow for 122 days and worked satisfactorily.

Capital. No expenditure was incurred under this head.

Extensions and Improvements. A sum of Rs. 5,632 was incurred under this head.

Maintenance and Repairs. The canal and its branches were maintained in good order at a total cost of Rs. 33,312, including the work-charged establishment.

Irrigation. The area irrigated during the year was 48,852 acres, (kharif 42,158 acres and rabi 6,694 acres), against 63,172 acres, (kharif 40,597 acres and rabi 22,575 acres), in the previous year and 59,092 acres, the average of the previous three years.

Financial Results. The gross revenue for the year amounted to Rs. 1,32,792 against Rs. 89,218 last year. Deducting working expenses, viz. Rs. 57,405, the net revenue was Rs. 75,387.

General Remarks The remissions granted during the year amounted to Rs. 17,733, against Rs. 87,577 remitted last year.

The principal crops grown were :—

Rice	..	..	9,234 acres.
Cotton	..	..	1,097 ,,
Jowari	..	..	23,837 ,,
Bajri	..	..	5,941 ,,
Wheat	..	..	5,450 ,,

and the estimated value of the whole outturn was Rs. 8,55,662, or Rs. 18 per acre.

Dambhro Canal System.

80. The canal was in flow for 95 days during the year.

Capital. No capital expenditure was incurred during the year under report.

Extensions and Improvements. An expenditure of Rs. 89 was incurred under this head.

Maintenance and Repairs. The canal was maintained in good order at a total cost of Rs. 5,634, including the work-charged establishment.

Irrigation. The area irrigated during the year was 11,699 acres, (kharif 9,759 acres and rabi 1,940 acres), against 15,132 acres, (kharif 13,050 acres and rabi 2,082 acres), in the previous year and 15,515 acres the average of the previous three years.

Financial Results. The gross revenue amounted to Rs. 29,142, against Rs. 24,216 last year. Deducting working expenses, viz. Rs. 8,976, the net revenue during the year was Rs. 20,166.

General Remarks. The remissions granted during the year amounted to Rs. 4,438, against Rs. 17,714 last year.

The principal crops grown were :—

Jowari	..	..	7,431 acres.
Bajri	..	..	1,754 ,,
Wheat	..	..	1,705 ,,

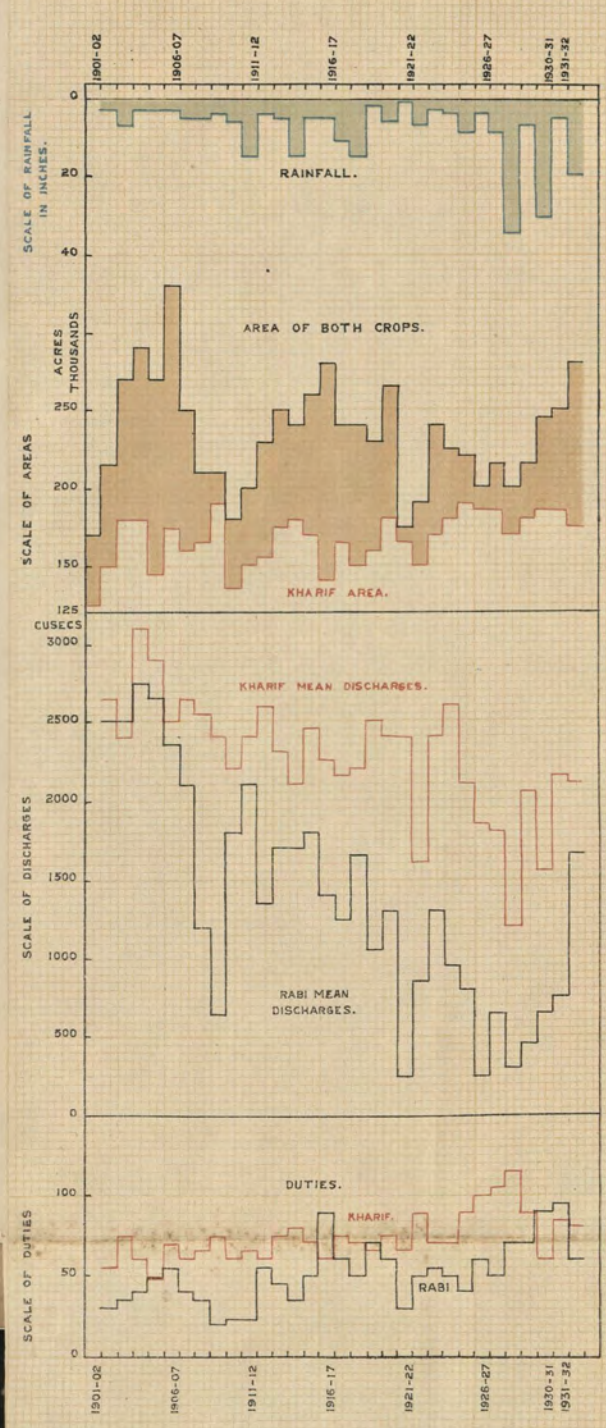
and the estimated value of the whole outturn was Rs. 1,96,309, or Rs. 17 per acre.

(2) UNPRODUCTIVE.

Jamrao Canal.

81. The Jamrao Canal and branches were maintained in good order. The average discharges in the kharif and rabi seasons were 2,124 cusecs and 1,649 cusecs respectively. The rainfall during the year was timely and beneficial to the crops.

Capital. No expenditure was incurred under this head. A sum of Rs. 32,552 was recovered from colonists and credited to this head.



JAMRAO CANAL

WORKING RECORD UP TO 1931-1932

NOTE:—

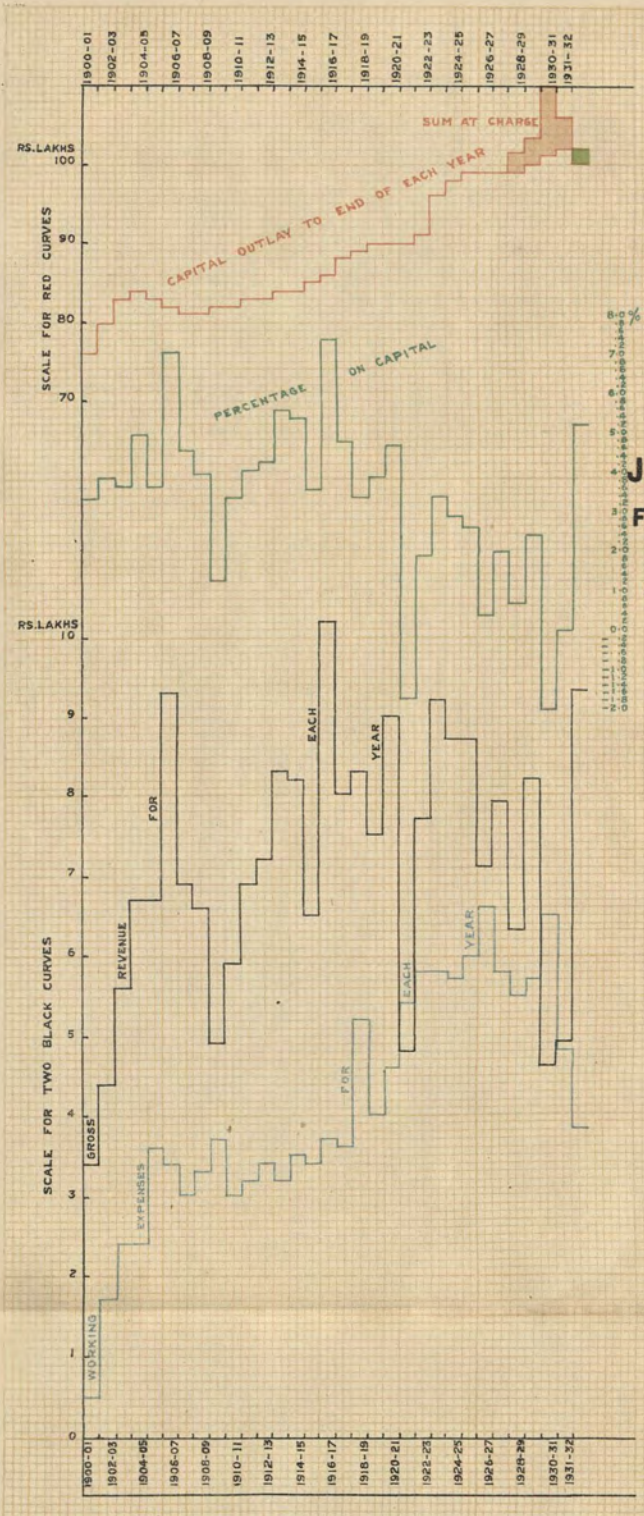
(1) The intercepts in the red area show the rabi area each year.

(2) The discharges are average discharges at head calculated on the total number of days of the season concerned,

(3) The duties are calculated on the above areas and discharges.

(4) The rainfall is average rainfall for all the stations on the canal.

G.P.Z.O. Poona, 1933.



JAMRAO CANAL

FINANCIAL RECORD UP TO 1931-1932

NOTE:—

(1) Construction commenced in November 1894

(2) Canal was opened on 24th November 1899.

(3) The intercepts in the red area show arrears of interest unpaid up to end of each year, which being added to the capital give sum-at-charge.

(4) Since interest is less than net revenue in 1931-32, sum at charge has decreased this year and to show this decrease the hatching is done in green colour

(5) Increase in gross revenue in 1931-32 is due to good cultivation appreciable fall in working expenses in the same year is on account of retrenchment in works.

G.P.Z.O.Poona, 1933.

Extensions and Improvements. A sum of Rs. 467 was spent under this head.

Maintenance and Repairs. The canal and its minors were maintained in good order throughout the year at a cost of Rs. 1,97,689, including work-charged establishment.

The total area irrigated during the year was 276,984 acres, (kharif 174,855 acres and rabi 102,129 acres), as compared with 252,184 acres, (kharif 184,353 acres and rabi 67,831 acres), last year and 237,045 acres the average cultivation of the previous three years.

Financial Results. The gross revenue of the year amounted to Rs. 9,25,048, as compared with Rs. 4,92,552 for last year and Rs. 5,88,316 the average of the previous three years. Deducting working expenses, viz. Rs. 3,81,267, the net revenue during the year was Rs. 5,43,781.

General Remarks. The remissions granted during the year amounted to Rs. 1,38,203 against Rs. 385,408 last year.

The principal crops grown were :—

Cotton	.. ..	102,063 acres.
Bajri	.. ..	51,554 ,,
Wheat	.. ..	85,012 ,,

and the value of the whole outturn, as estimated by the Revenue authorities, is Rs. 52,65,531 or Rs. 19 per acre.

Eastern Nara System.

82. The season under report commenced with a late rise in the river, but the river level remained more or less steady throughout the abkalani and the season was, on the whole, good. The Nara River (Supply Channel) worked satisfactorily, and its banks gave no trouble. There were several small breaches on the Mithrao Canal but they were promptly closed and no serious damage was caused either to life or property.

Capital. No expenditure was incurred on Improvements to the Nara Supply Channel. A sum of Rs. 17,203, recovered from colonists, was credited to this head.

Extensions and Improvements. A sum of Rs. 195 was spent under this head during the year under report.

Maintenance and Repairs. The canals were maintained in good order at a cost of Rs. 3,23,867, including work-charged establishment.

Irrigation. The area irrigated during the year was 258,759 acres, (kharif 199,360 acres and rabi 59,399 acres), as compared with 234,003 acres, (kharif 192,870 acres and rabi 41,133 acres), last year and 232,385 acres the average of the previous triennium.

Financial Results. The gross revenue amounted to Rs. 5,79,984, as compared with Rs. 3,61,693 for last year and Rs. 3,84,011 the average of the previous triennium. Deducting Rs. 3,40,651 for working expenses and Rs. 3,100 for the share due to old irrigation, the net revenue during the year was Rs. 2,36,233.

General Remarks. The remissions granted amounted to Rs. 1,28,733, against Rs. 2,20,891 for last year.

The principal crops grown were :—

Rice	.. ..	69,824 acres.
Bajri	.. ..	73,874 ,,
Cotton	.. ..	47,016 ,,
Wheat	.. ..	46,875 ,,

and the value of the outturn is estimated by the Revenue authorities at Rs. 54,85,978, or Rs. 21 per acre.

Dad Canal System.

83. The canal did not work satisfactorily and only flowed for 100 days during the year.

Capital. No expenditure was incurred under this head. A sum of Rs. 34 was recovered from the colonists on account of water-courses during the year under report, and was credited to this head.

Extensions and Improvements. No expenditure was incurred under this head during the year.

Maintenance and Repairs. The canal and its branches (including the Ren Distributary) were maintained in good order at a total cost of Rs. 1,32,391, including work-charged establishment.

Irrigation. The total area irrigated during the year was 91,098 acres, (kharif 82,112 acres and rabi 8,986 acres), as compared with 118,441 acres (kharif 99,358 acres and rabi 19,083 acres) last year and 127,167 acres the average of the previous three years.

Financial Results. The gross revenue of the year amounted to Rs. 1,99,802, as compared with Rs. 1,90,805 of the previous year and Rs. 2,51,589 the average of the three previous years. Deducting working expenses, viz. Rs. 203,756, and the share due to old irrigation Rs. 38,699, there was a loss of Rs. 42,233 on this canal during the year.

General Remarks. The remissions granted during the year amounted to Rs. 78,457, against Rs. 1,13,675 remitted last year and Rs. 81,495 the average of the previous three years.

The principal crops grown were :—

Rice	.. ..	13,739 acres.
Jowari	.. ..	23,502 ,,
Bajri	.. ..	34,839 ,,
Cotton	.. ..	3,393 ,,
Wheat	.. ..	1,990 ,,
Other crops	.. ..	5,626 ,,

and the estimated value of the whole outturn was Rs. 17,11,369, or Rs. 19 per acre.

NASRAT CANALS SYSTEM.

84. The Lundi Head to the Nasrat Canal again worked well this year and the canal was in flow for 122 days during the year.

Capital. No expenditure was incurred under this head during the year under report.

Extensions and Improvements. No expenditure was incurred under this head.

Maintenance and Repairs. The canal and its branches were maintained in good order at a cost of Rs. 58,283, including work-charged establishment.

Irrigation. The total area irrigated during the year was 102,696 acres (kharif 96,656 acres and rabi 6,040 acres), as compared with 115,606 acres (kharif 100,191 acres and rabi 15,415 acres) last year, and 119,750 acres the average cultivation of the past triennium.

Financial Results. The gross revenue of the year amounted to Rs. 2,70,511, as compared with Rs. 2,00,030 of the previous year, and Rs. 2,46,564 the average of the previous three years. Deducting working expenses viz., Rs. 99,492, and the share due to old irrigation viz. Rs. 53,046, the net revenue during the year was Rs. 1,17,973.

General Remarks. The remissions granted during the year amounted to Rs. 52,561, against Rs. 1,32,062 remitted last year.

The principal crops grown were :—

Juwari	..	38,690	acres
Bajri	..	11,976	,,
Cotton	..	31,785	,,
Wheat	..	3,486	,,

and the estimated value of the whole outturn was Rs. 19,08,336, or Rs. 19 per acre.

HASSANALI CANAL SYSTEM.

85. The Hassanali Canal takes off from the Indus near Katiar, and has a favourable head. The canal flowed for 128 days during the year. There were no complaints of deficiency of water except in the extreme tail for the benefit of which " rotations " were successfully enforced.

Capital. No expenditure was incurred under this head.

Extensions and Improvements. No expenditure was incurred.

Maintenance and Repairs. The canal and it's branches were maintained in good order at a cost of Rs. 20,076, including work-charged establishment.

Irrigation. The area irrigated during the year was 18,702 acres (kharif 17,323 acres and rabi 1,379 acres), as compared with 21,076 acres, (kharif 19,311 acres and rabi 1,765 acres), irrigated last year and 22,650 acres the average of the previous three years.

Financial Results. The gross revenue during the year amounted to Rs. 52,052, as compared with Rs. 36,754 in the previous year, and Rs. 45,563 the average of the previous three years. Deducting Rs. 32,180 for working expenses and Rs. 2,458 for the share due to old irrigation, the net revenue during the year was Rs. 17,414.

General Remarks. The remissions of the year amounted to Rs. 7,273, against an amount of Rs. 15,932 remitted last year.

The principal crops grown were :—

Rice	..	..	14,134	acres
Bajri	..	..	2,886	,,
Oil seeds	..	..	1,078	,,

and the estimated value of the whole outturn was Rs. 4,42,769, or Rs. 23 per acre.

(b) Works for which Capital Accounts are not kept.

CANALS.

Nasrat Canals Division.

86. The principal canals under this classification are the Mehrab and other canals.

Extensions and Improvements. No expenditure was incurred under this head during the year.

Maintenance and Repairs. All the Canals classified under this head were maintained in good order at a cost of Rs. 13,527, inclusive of work-charged establishment.

Irrigation. The total area irrigated on these canals during the year was 13,371 acres, (kharif 12,392 acres and rabi 979 acres), as compared with 16,177 acres (kharif 12,693 acres and rabi 3,484 acres), irrigated during the previous year and 17,101 acres the average of the past triennium.

Financial Results. The total canal revenue amounted to Rs. 27,903, and the maintenance and revenue collection charges were Rs. 15,467.

General Remarks. The remissions granted during the year amounted to Rs. 3,620, against the amount of Rs. 20,285 remitted last year.

The principal crops grown were :—

Juari	..	..	7,132	acres.
Bajri	..	..	4,871	,,

and the estimated value of the whole out-turn was Rs. 2,35,163, or Rs. 18 per acre.

Hyderabad Canals Division

87. The principal canals under this head are the old Ren and two or three other very small canals.

Extensions and Improvements. No expenditure was incurred under this head during the year.

Maintenance and Repairs. All the canals were maintained in good order at a cost of Rs. 946, inclusive of work-charged establishment.

Irrigation. The total area irrigated was 1,614 acres (kharif 1,317 acres and rabi 297 acres), as compared with 2,876 acres (kharif 900 acres and rabi 1,976 acres), irrigated during last year, and 2,553 acres the average of the previous three years.

Financial Results. The total canal revenue amounted to Rs. 2,997, and maintenance and revenue collection charges were Rs. 1,102.

General Remarks. The remissions granted during the year amounted to Rs. 1,099 against the amount of Rs. 2,367 remitted in the previous year.

The principal crops grown were :—

Bajri	.. ..	1,024 acres.
Juari	.. ..	253 ,,
Wheat	.. ..	212 ,,

and the estimated value of the whole out-turn was Rs. 31,968, or Rs. 20 per acre.

Bunds.

88. All the bunds in the Indus Left Bank Circle stood the water pressure well ; small breaches occurred but caused no damage.

89. A sum of Rs. 1,71,739 was spent under this head. Of this a sum of Rs. 1,47,134 was spent in the Nasrat Canals Division, and Rs. 24,605 in the Fuleli Canals Division.

Extensions and Improvements.

Maintenance and Repairs. All the bunds in the Circle were maintained in good order at a cost of Rs. 1,19,657, inclusive of work-charged establishment. Of this amount a sum of Rs. 2,868 was spent in the Hyderabad Canals Division, Rs. 56,765 in the Nasrat Canals Division, and Rs. 60,024 in the Fuleli Canals Division. Nothing was spent on special surveys in this Circle.

General Remarks. The total mileage of Bunds in the Hyderabad Canals Division is 5 miles, in the Nasrat Canals Division 66 miles, and in the Fuleli Canals Division 45 miles.

Expenditure on and receipts from gardens.

90. The figures of expenditure on, and receipts from, gardens, during the year are compared below with those of the previous triennium :—

Year.	Expenditure on maintenance of gardens during the year.	Receipts during the year.
	Rs.	Rs.
1928-29	10,221	1,433
1929-30	9,842	702
1930-31	9,272	1,803
1931-32	9,575	1,431

5. LLOYD BARRAGE AND CANALS CONSTRUCTION.

General Remarks.

91. The scheme consists of a Barrage or Weir across the river Indus, three miles below the gorge at Sukkur, with three canals on the Right Bank and four on the Left Bank taking off therefrom, each with a separate Head Regulator.

The year under report was the seventh full working year, and was devoted to the designing and excavation of numerous channels, including water-courses, and the construction of many masonry structures such as regulators, bridges, etc.

The permanent works were all completed, and the Barrage and Canals were formally opened by His Excellency the Viceroy on the 13th January 1932.

Owing to the completion of the Lloyd Barrage works, the Sind Public Works Department and the Lloyd Barrage and Canals Construction Administrations were amalgamated and reorganised with effect from December 1931.

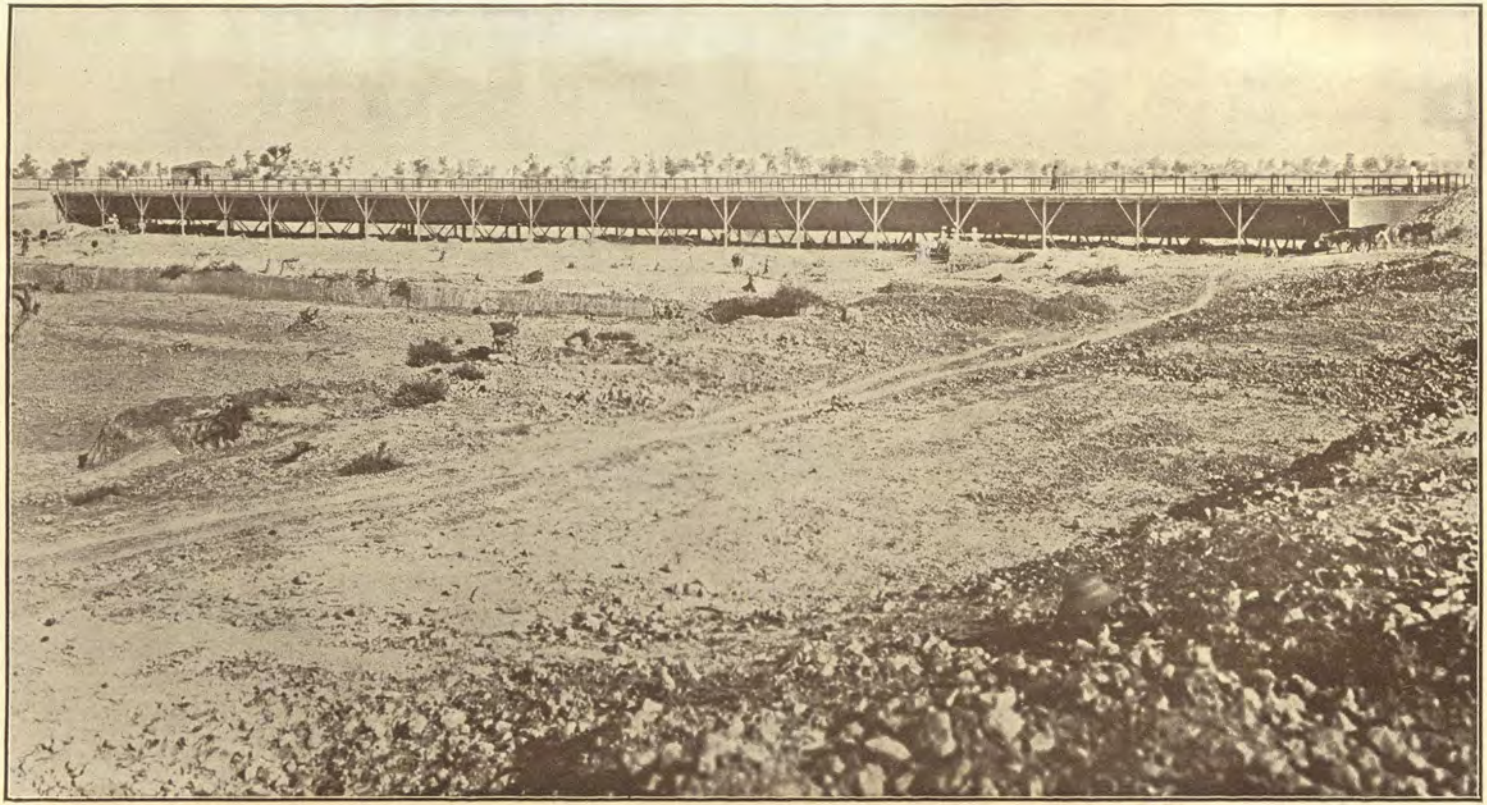
92. *Progress on Barrage works.*—Throughout the year, as far as the conditions of the river Indus permitted, the work on the main superstructure masonry of the Barrage and regulators etc., was continued and by the end of the year the whole of the superstructure of the Barrage including the gates, counterweights, bridges and divide walls, had been completed.

Progress on Canals.

93. The North Western Canal, the Dadu Canal, the Rice Canal and part of the Rohri Canal, were opened for the first time for soaking the banks and general testing purposes. Progress on the New Cut to, and canalization of, the Nara River was satisfactory. The few breaches which occurred on account of the gradual raising of the water level were promptly closed, while the masonry structures stood the test very well. Satisfactoy progress was made with the excavation work, and construction of masonry

WESTERN SIND CIRCLE, MANCHAR DRAINAGE DIVISION.

View showing machine 'Akbar' 300 Ruston excavating the New Cut to the Manchar Drain.

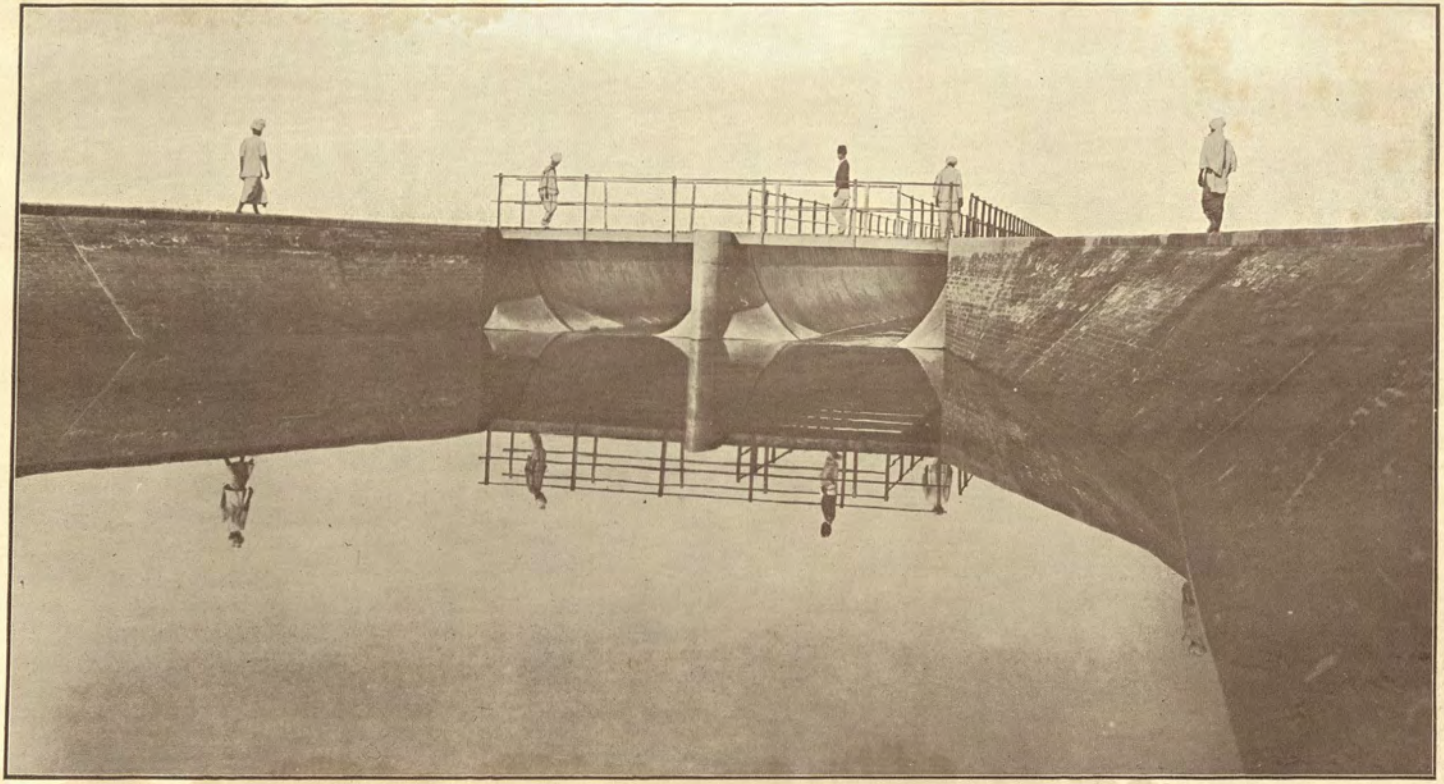


G. P. Z. P. 1933.

SOUTHERN DADU DIVISION.

Johi Branch Aqueduct Over Main Drain.

FRONT VIEW.



G. P. Z. P. 1933.

SOUTHERN DADU DIVISION.

Johi Branch Aqueduct Over Main Drain.

END VIEW.

structures on the remaining canals, and branches. The preparation of plans and estimates for remodelling and extending channels in the Khairpur State was proceeding. Good progress was made in the preparation of designs for water-courses. A revised Flood Protective Bund Scheme was sanctioned. The total length of main canals, branches escapes, distributaries and minors is 6,816 miles of which 6,136 miles were completed. The total quantity of earthwork done to the end of March 1932 was about 560 crores cubic feet, which is equivalent to the excavation of a channel 530½ miles long, 200 feet wide and 10 feet deep.

General Items.

94. The Development and Research Division was engaged in carrying out sub-soil investigations on both banks of the Indus, in order to ascertain what effect the opening of the Barrage Canals is likely to have in regard to water-logging. In addition to this work the Division was also engaged on the designs for regulators and bridges, and experiments on the models connected with projected designs for regulators, Hume pipe culverts, syphons etc.

95. The sub-rectangulation survey of the area commanded by the Canals of the Scheme was being carried out by the staff under the Revenue Officer attached to the Barrage Administration.

6. INDUS RIVER COMMISSION.

96. The expenditure on all works, including surveys carried out under the direct supervision of the Chief Engineer in Sind, during the year under report, was charged to " 15–Other Revenue Expenditure financed from ordinary Revenues, Works for which neither Capital nor Revenue accounts are kept."

Survey of the Indus.

97. The main course of the River commencing at a point opposite Rojhan above Kashmore, down to the bifurcation at the Delta, was surveyed and plotted. The total length of the traverse carried out during the year was 992 miles, compared with 879 miles last year.

Demarcation and Maintenance of District and State Boundaries.

98. Several works in connection with the demarcation of boundaries were carried out.

Gauge Readings and River Discharges.

99. The daily gauge readings were observed along the Indus at Mithankot, Machka, Sarhad, Sukkur, Bhagotoro, Kotri, Mehrani, Hajipur, Jherruck, Gharo and Chowgazo.

Daily gauge and discharge observations were taken at the following six sites :—

(1) River Chenab at Daka
(2) Sind site near Daka on Indus } Above the confluence of the River Chenab.
(3) Mithankot (below confluence).
(4) Sukkur.
(5) Kotri.
(6) Hajipur.

Discharges were also observed of the following canals :—

(1) Eastern Nara Channel.
(2) Khairpur Canals.
(3) Chario wah for Manchar Dhand.
(4) Fuleli Canal.

The discharge observations at all the river sites were made by means of a rack and pinion machine.

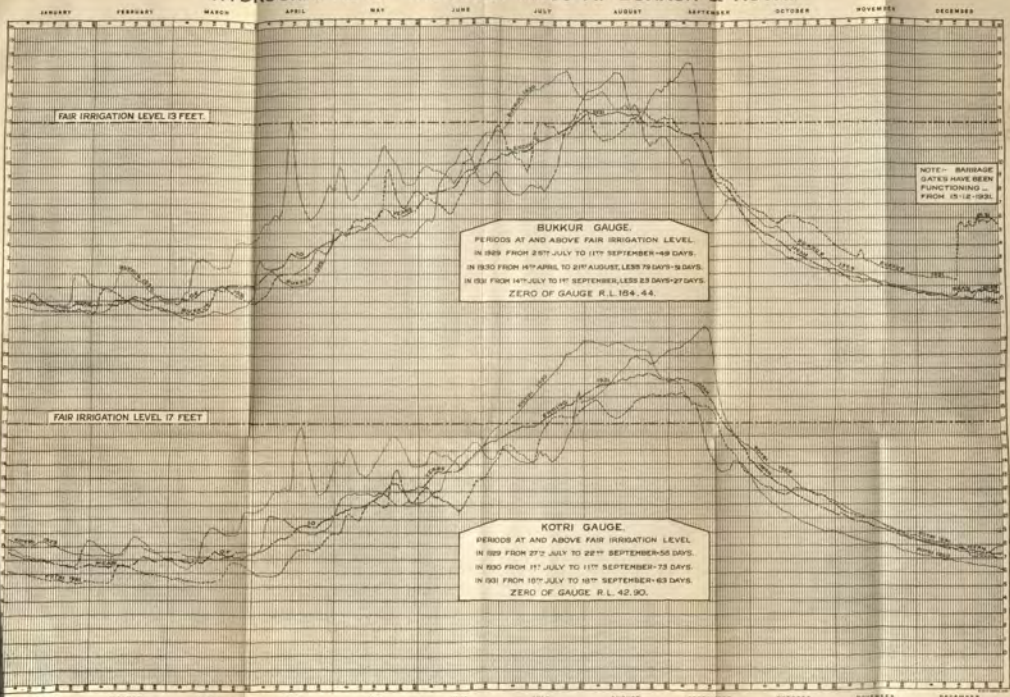
Scientific Works and Discharges of the Indus.

100. The discharge and other Scientific observations were continued at the six sites mentioned above, the results of which will be published separately. The total monthly discharges at Sukkur during the inundation season, and the maximum, minimum and average monthly discharges of the year, compared with the results of the previous years, are as follows :—

Month.	1927–28 Cusecs.	1928–29 Cusecs.	1929–30 Cusecs.	1930–31 Cusecs.	1931–32 Cusecs.
June*	4,120,000	9,170,000	5,720,000	7,460,000	4,947,000
July*	9,880,000	11,100,000	7,900,000	16,230,000	9,457,000
August*	14,550,000	10,350,000	15,340,000	13,470,000	11,584,000
September*	6,310,000	7,820,000	10,640,000	6,290,000	7,489,000
Total ..	34,860,000	38,440,000	39,600,000	43,450,000	33,477,000
Average Discharge ..	286,000	315,000	325,000	356,000	274,000
Maximum Discharge ..	625,000	477,000	702,000	657,000	447,000
Minimum discharge June to September ..	95,300	108,500	93,100	104,700	100,000
Minimum discharge observed throughout the year ..	27,200	30,500	33,700	27,900	11,800

* Totals of daily discharges.

HYDROGRAPHS OF THE RIVER INDUS AT BUKKUR & KOTRI.


JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
FAIR IRRIGATION LEVEL 13 FEET.
NOTE:- BARRAGE GATES HAVE BEEN FUNCTIONING ... FROM 13-12-1931.
BUKKUR GAUGE.
PERIODS AT AND ABOVE FAIR IRRIGATION LEVEL.
IN 1929 FROM 25TH JULY TO 11TH SEPTEMBER=49 DAYS.
IN 1930 FROM 16TH APRIL TO 21ST AUGUST, LESS 79 DAYS=9 DAYS.
IN 1931 FROM 14TH JULY TO 1ST SEPTEMBER, LESS 23 DAYS=27 DAYS.
ZERO OF GAUGE R.L. 154.44.
FAIR IRRIGATION LEVEL 17 FEET.
KOTRI GAUGE.
PERIODS AT AND ABOVE FAIR IRRIGATION LEVEL.
IN 1929 FROM 27TH JULY TO 22ND SEPTEMBER=56 DAYS.
IN 1930 FROM 1ST JULY TO 11TH SEPTEMBER=73 DAYS.
IN 1931 FROM 18TH JULY TO 18TH SEPTEMBER=63 DAYS.
ZERO OF GAUGE R.L. 42.90.

101. *Fleet.*—Necessary repairs were carried out to S. S. Fateh Mubarak, S. L. Madge, S. L. Hussaini, M. L. Dorothy and M. L. Margaret during the year under report.

Extensions and Improvements and Special Repairs.

102. The estimated cost of the works under these heads sanctioned or approved during the year 1931-32 by the Indus River Commission, for execution by the Executive Engineers or by the Indus River Commission, is as follows :—

Division.	Extensions and improvements.	Repairs.	Total.
Indus Right Bank Circle.	Rs.	Rs.	Rs.
Begari Canals	44,986	2,25,106	2,70,092
Shikarpur Canals	3,28,288	5,43,035	8,71,323
Ghar Canals	14,352	....	14,352
Western Nara	18,845	86,063	1,04,908
Karachi Canals	2,65,154	89,046	3,54,200
Total ..	6,71,625	9,43,250	16,14,875
Indus Left Bank Circle.			
Fuleli Canals	1,20,896	43,839	1,64,735
Nasrat Canals	2,87,182	3,12,530	5,99,712
Hyderabad Canals	....	6,844	6,844
Total ..	4,08,078	3,63,213	7,71,291
Indus River Commission.			
Karachi Buildings	13,219	....	13,219
Indus River Gauging	7,890	....	7,890
Grand Total. ..	11,00,812	13,06,463	24,07,275

Erosion.

Begari Canals Division.

103. *R. B. Unharwah Manguli, Tori Bund.*—Erosion started in the section between mile 7/7 and 11/6 of the Bund.

The minimum distance between the river and the bund (1896 loop) along the ordinate at mile 2/11, was about 2,600 feet.

The Unharwah mouth was eroded for a distance of 500 feet during the year.

Shikarpur Canals Division.

104. (1) *Kasimpur Bund.*—Erosion started in the length from the Janibwah to mile 3/3 of the bund. The portions of the Janibwah and the old bund as far as the head regulator of the Janibwah were completely eroded. The minimum distance between the new bund and the river at mile 2/1 of the bund, was about 4,200 feet.

(2) *Sukkur-Begari Bund.*—Erosion started in the reach from mile 25/1 to 28/3. The minimum distance between the river and the Satabani loop was about 4,000 feet, and is situated at a point opposite mile 2/6 of the loop bund.

Karachi Canals Division.

105. (1) *Mulchand-Shahbunder Bund.*—Erosion started in the section opposite mile 16/6 to 18/0 of the bund during July 1931 ; a portion of the bund from mile 17/2 to 17/3 was completely eroded. The Gugo loop had already been constructed behind the front bund, and the minimum distance from the river to Gugo loop along the ordinate at mile 1/10 of the loop, was about 1,520 feet.

(2) *Sonda-Taraki Loop.*—Erosion occurred along the whole line from mile 0/0 to 3/2, and the minimum distance between the river and the bund along the ordinate at mile 0/5 was about 900 feet only. A new bund called the Sonda loop has since been constructed behind the Sonda-Taraki loop.

(3) *Baghar Uchito Bund.*—Erosion occurred between miles 32/7 and 34/0 of the bund. The portion from mile 33/6 to 33/7 was completely eroded in March 1931 and a new bund, called the Uderolal loop, has since been constructed.

No. Rev. 7065.

REVENUE DEPARTMENT.

CAMP OF THE COMMISSIONER IN SIND.

18th December 1933.

Subject.—Irrigation Administration Report—Part II—Sind—1931-32

MEMORANDUM.

The Commissioner in Sind presents compliments and, in continuation of his endorsement No. Rev. 6816, dated the 5th December 1933, on the subject noted above, has the honour to submit the following remarks together with a comparative statement showing the area irrigated and the assessment levied thereon in each of the three years ending 1931-32 and the average for the preceding three years ending 1930-31.

2. The season under report was on the whole not satisfactory. The inundation was at first very low. The Bukkur gauge reached 10·5 feet for the first time on 23rd June 1931. Thereafter it began to rise but fell immediately and on 10th July it read 9·5 feet only. The fair irrigating level of 13 feet was first reached only on the 14th July 1931. Subsequently, however, the river continued to be fairly steady and maintained a moderately good level till the middle of September. The result of the late rise of the river was that transplantation of rice was greatly impeded and other agricultural operations were retarded to a considerable degree and there was accordingly a shrinkage in cultivation. The level of 13 feet and over, continued with fluctuations for 27 days as compared with 50 days in 1930, 49 days in 1929, 11 days in 1928 and 37 days the average of the last three years. The fair irrigating level of 17 feet on the Kotri gauge was first reached on the 19th July 1931. This or a higher level lasted for a period of 63 days as against 73 days in 1930, 58 days in 1929, 85 days in 1928 and 72 days the average of last 3 years. The highest reading in the year was 13·9 feet on 30th July 1931 at Bukkur and 19·3 feet on 1st September at Kotri as compared with 16·9 feet on 24th July 1930 and 23·1 feet on 30th July 1930 and the maximum levels of 17·9 feet and 24·1 feet ever previously recorded on these two gauges.

On account of the low inundation, deficiency of water was felt on some canals especially at the tails. The mouth of the Dad Canal in the Nawabshah district silted up owing to erosion and in consequence failed to give full supply; the crops on this system suffered from drought resulting in heavy remissions.

The rainfall as in the previous year was below the average. The few showers that fell were beneficial to crops but were not adequate for the growth of fodder or for cultivation in Barani tracts.

In the province as a whole there has been a decrease of about 5 per cent. both under cultivation on canals and assessment, from 32½ lacs to 30½ lacs of acres and 106 to 101 lacs of rupees respectively.

3. The figures of cultivation for the two Circles as compared with the figures of 1930–31, and the average of the three years ending 1930–31 are given in the sub-joined statement.

	As compared with 1930–31.		As compared with the average of the three years ending 1930–31.	
	Kharif.	Rabi.	Kharif.	Rabi.
Indus Right Bank Circle	— 80,000	— 49,000	—1,20,000	— 9,000
Indus Left Bank Circle	— 79,000	+ 20,000	—1,23,000	+ 51,000

4. There was a total decrease of 2,01,000 acres in the area under cultivation as compared with the average of the previous triennium.

5. Remission of land revenue amounted to Rs. 16,67,000 as against Rs. 32,66,000 in the previous year and Rs. 19,76,000 the average of the preceding three years. Of the total remissions, Rs. 5,07,000 were due to deficiency of water supply, Rs. 2,05,000 due to breaches in canals, Rs. 1,22,000 due to damage caused by rats, locusts and insects and Rs. 65,000 due to floods and erosion as against Rs. 7,90,000, Rs. 3,30,000, Rs. 1,84,000 and Rs. 2,29,000 respectively in the previous year. The other principal causes of remission were as under :—

	Rs.
(*a*) Frost and adverse winds	39,000
Against .. .. .. in the previous year	61,000
(*b*) Blight or Mahlo	20,000
Against .. .. .. in the previous year	24,000

Besides these, special remissions were granted on account of the fall in prices which amounted to more than 7 lacs of rupees.

6. The outstanding balance of land revenue at the end of the year amounted to Rs. 11,28,000 (Rs. 4,26,000 in the Right Bank Circle and Rs. 7,02,000 in the Left Bank Circle) as against Rs. 16,41,000 in the previous year and Rs. 9,04,000, the average of the last triennium.

7. The following statement gives details regarding the principal items of expenditure incurred on new works in connection with the several canals :—

Name of Canal.	Name of work.	Amount.
		Rs.
1. Kalri Canal	.. Remodelling the Kalri and Narichach canals	2,84,000
2. Fuleli Canal system	.. Remodelling and moduling Sanhi Guni and several wahs constructing new distributaries on Fuleli Right and Left Banks, a regulator at mile 30, and an intermediate regulator at mile 62 of Fuleli Canal, effecting improvements to Fuleli escape and widening Fuleli from Head to mile 5.	6,40,000
3. Rohri Canals	.. Regrading and moduling channel No. I ..	35,000
4. Sind Canal	.. Excavating a new mouth at mile 24/6 of the Sukkur Begari bund.	25,000

In addition to the above expenditure a sum of Rs. 23,000 was spent on providing regulator gates along Uch Rajwah mile 5/23 Left Bank ex the Desert Canal, extensions and improvements to Begari, Rohri, Garang, Baghar, Jamrao Canals, Western Nara, Ghar Mahmudo, Fuleli Canal, Nau Lakhi Canal and Eastern Nara System and survey of certain minor works on the Pinyari Canal.

A sum of Rs. 4,47,000 was moreover spent on raising and strengthening and extending the following bunds and the works connected therewith :—

(1) Arain Loop Bund.

(2) Kassimpur bund.

(3) Sukkur Begari bund.

(4) River bunds on the left bank.

(5) Adurtakio loop mile 0/0 to 5/0.

(6) Bunds in the Nasrat and Fuleli Canals Divisions.

8. The subjoined statement shows the amount spent on maintenance and repairs in the year under report as compared with that spent in the previous year and the average of the three years ending 1930–31 :—

Circle.	1931–32.	1930–31.	Average of the three years ending 1930–31.
	Rs.	Rs.	Rs.
Indus Right Bank Circle	30,30,000	40,00,000	39,97,000
Indus Left Bank Circle	19,19,000	22,35,000	23,80,000

Out of this, the actual expenditure on clearance and repairs was as follows :—

	1931-32.	1930-31.	Average of the three years ending 1930-31.
Indus Right Bank Circle	17,31,000	26,09,000	24,54,000
Indus Left Bank Circle	8,00,000	10,35,000	10,69,000

R. E. GIBSON,
Commissioner in Sind.

To

The Secretary to Government, Public Works Department, Bombay.

Statement showing cultivated area and assessment of Government, jagir and foreign lands for the years 1929-30, 1930-31, 1931-32 *together with average of three years ending* 1930-31.

(*Area in acres.*)

Year.	Indus Right Bank Circle.			Indus Left Bank Circle.			Total.		
	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.	Kharif.	Rabi.	Total.
1929-30 ..	14,08,782	3,93,537	18,02,319	13,61,846	1,97,994	15,59,840	27,70,628	5,91,531	33,62,159
1930-31 ..	13,20,205	4,31,759	17,51,964	12,47,546	2,47,795	14,95,341	25,67,751	6,79,554	32,47,305
1931-32 ..	12,39,918	3,83,202	16,23,120	11,68,686	2,68,245	14,36,931	24,08,604	6,51,447	30,60,051
Average of 3 years ending 1930-31.	13,60,317	3,92,503	17,52,820	12,91,186	2,16,881	15,09,067	26,51,503	6,09,384	32,60,887

Assessment in rupees.

Year.	Total assessment in the Indus Right Bank Circle.	Total assessment in the Indus Left Bank Circle.	Total of the two Circles.
	Rs.	Rs.	Rs.
1929-30	62,99,021	46,06,393	1,09,05,414
1930-31	61,17,478	45,06,776	1,06,24,254
1931-32	56,98,807	43,79,593	1,00,78,400
Average of three years ending 1930-31 ..	61,68,949	44,76,479	1,06,45,428

A. P. LeMESURIER,
Assistant Commissioner in Sind.

GOVERNMENT OF BOMBAY.

PUBLIC WORKS DEPARTMENT.

Resolution No. P. 22/30390.

Bombay Castle, 15th February 1934.

Letter from the Chief Engineer in Sind, No. P. 278-W/2, dated 20th October 1933.

Letter from the Chief Engineer in Sind, No. P. 278-W/2, dated 28th November 1933.

} Submits the Administration Reports of the late Indus Right and Indus Left Bank Circles, Lloyd Barrage and Canals Scheme and Indus River Commission for the year 1931-32.

RESOLUTION—*Inundation.*—The inundation during the year under report was low. The Indus, however, remained fairly steady and maintained a moderately good level up to the middle of September 1931. On account of the low inundation, deficiency of water was felt on some canals, especially in their lower reaches. The rainfall was below the average.

EXISTING IRRIGATION WORKS.

2. *Cultivation.*—The area irrigated during the year was 3,060,051 acres, a decrease of 187,254 acres compared with the figure of the previous year. This is exclusive of 432,080 acres of 'dubari' or twice-cropped land.

3. *Financial results.*—The following table compares receipts and expenditure of the year with those of the previous three years, on capital and non-capital irrigation works :—

Year.	Gross Revenue.	Working expenses.	Net Revenue.
	Rs.	Rs.	Rs.
1928-29 ..	95,89,661	70,13,433	25,76,228
1929-30 ..	78,43,982	73,47,025	4,96,957
1930-31 ..	62,17,252	69,34,199	—7,16,947
1931-32 ..	84,30,500	55,15,923	29,14,577

4. The capital invested on the existing works for which capital accounts are kept, up to the end of the year under review, was Rs. 4,78,54,210 distributed as under :—

	Rs.
Productive	2,15,85,585
Unproductive	2,62,68,625
	4,78,54,210

The net receipts on capital works (exclusive of the share due to old irrigation) amounted to Rs. 38,80,431, which gives a return of 8·11 per cent. on the capital invested. The percentages of the previous three years were as under :—

1928–29	..	..	7·68
1929–30	..	..	3·58
1930–31	..	..	1·30

5. The rate of working expenses per acre irrigated was Rs. 1·80, as compared with Rs. 2·13 in the previous year.

6. The net consolidated assessment per acre on Government land in the Indus Right Bank Circle was Rs. 3·11, against Rs. 2·56 during the previous year. In the Indus Left Bank Circle it was Rs. 2·73 against Rs. 2·20 during the previous year.

7. The value of crops grown was Rs. 582 lakhs, which shows a decrease of Rs. 104 lakhs when compared with the figure for the previous year.

LLOYD BARRAGE AND CANALS SCHEME.

8. The progress made on this scheme since the commencement of work in 1923 has been satisfactory. On the Barrage proper the permanent works were all completed. Of the total length of 6,816 miles of main canals, branches, distributaries and minors 6,136 miles were completed. The Barrage and Canals were formally opened by His Excellency the Viceroy on the 13th January 1932.

By order of the Governor in Council,

J. R. PHILLIPS,
Deputy Secretary to Government,
Irrigation and Railways.

To

The Finance Department.
The Revenue Department.
The Commissioner in Sind.
The Commissioner, Northern Division.
The Commissioner, Central Division.
The Commissioner, Southern Division.
The Chief Engineer in Sind.
All Superintending Engineers of Circles.
The Revenue Officer, Lloyd Barrage and Canals Scheme.
The Senior Superintendent of Land Records, Southern Circle.
The Director of Agriculture.
The Director of Information.
All Collectors in Sind including Deputy Commissioner, Upper Sind Frontier.
The Accountant General, Bombay.
The Audit Officer, Lloyd Barrage and Canals Construction.
All Executive Engineers in charge of Irrigation Works in Sind.

BOMBAY : PRINTED AT THE GOVERNMENT CENTRAL PRESS.

INDEX MAP
OF
SIND
to accompany the Irrigation Administration Report.
Part II. Sind.
1931-32.
REFERENCES
Canal Distributary Boundaries shown thus
Canals
Railway line
Bunds
" Under construction
River gauges R.G
Rain gauges
JACOBABAD
Kandhkot
Shikarpur
Garhi Yasin
Khanpur
Ubauro
Sukkur
Rohri
Sukkur Barrage
Lansdowne Bridge
Ghotki
Mirpur Mathelo
Ranipur
Kambar
LARKANA
Mehar
Khairpur
Nathesham
Dadu
Johi
Pedi-dan
Manchar Lake
Sehwan
Kotri
HYDERABAD
Tando Adam
Tando Muhammad Khan
Matli
Tando Bago
Jhuddo
Umarkot
Chachro
Mithi
Nagar Parkar
KARACHI
Keti Bandar
Mirpur Sakro
Gujjewal
Mugalbin
Ladiun
Rann of Cutch
Cutch
Arabian Sea
Ghar Canal
Western Nara
Kirthar
Fuleli
Khairpur Canals
Nasrat Canals
Eastern Nara
Rajputana
Begari
Shikarpur Canals
Jamrao Canal
Dadu Canal
Fuleli Canals
Nara Canals
Indus Steamer Route
Railway
Karachi Canal
Tatta
Shahdadkot
Sinjhoro
Nawabshah
Kandiaro
Sakrand
Manjhand
Thano Bulakhan
Jerruck
Shahdadpur
Alahyar
Sanghro
Mirpur Khas
Diplo
Chhor
Sindri
Mithrao
Badin
Shahdadkot
Ranipur
Khairpur
Nathesham
Dadu
Johi
Manchar Lake
Sehwan
Kotri
Thano Bulakhan
Jerruck
Tando Muhammad Khan
Matli
Tando Bago
Jhuddo
Umarkot
Chachro
Mithi
Nagar Parkar
Karachi
Keti Bandar
Mirpur Sakro
Gujjewal
Mugalbin
Ladiun
Rann of Cutch
Cutch
Arabian Sea
Ghar Canal
Western Nara
Kirthar
Fuleli
Khairpur Canals
Nasrat Canals
Eastern Nara
Rajputana
Begari
Shikarpur Canals
Jamrao Canal
Dadu Canal
Fuleli Canals
Nara Canals
Indus Steamer Route
Railway
Karachi Canal
Tatta
Shahdadkot
Sinjhoro
Nawabshah
Kandiaro
Sakrand
Manjhand
Thano Bulakhan
Jerruck
Shahdadpur
Alahyar
Sanghro
Mirpur Khas
Diplo
Chhor
Sindri
Mithrao
Badin

MAP OF SIND
SHOWING
ALL AREAS IRRIGATED
BY
EXISTING INUNDATION CANALS.
TO ACCOMPANY THE IRRIGATION ADMINISTRATION REPORT PART II, SIND
1931 - 32.
Scale 28 Miles = 1 Inch.
KASHMOR
JACOBABAD
SHIKARPUR
GODAPUR
SHAHDADKOT
SUKKUR
ROHRI
KAMBAR
LARKANA
KHAIRPUR
BADAN
RANIPUR
MEHRABPUR
PADIDAN
DADU
BHAN
SEHWAN
LAKI
NAWABSHAH
KHADRO
SHAHDADPUR
TANDO ADAM
MIRPURKHAS
TANDO ALLAHYAR
KOTRI
HYDERABAD
JAMESABAD
DIGRI
TANDO MUHAMMAD KHAN
JHUDO
BADIN
KARACHI
N.W.RY.
NARA RIVER
FRONTIER
DESERT
BEGARI CANAL
DAHEJI KHAN CANAL
RICE CANAL
KHIPRO CANAL
KACHI CANAL
BAGHAR CANAL
RAHIMKI CANAL
MULCHAND WAH
NASIR WAH
SHADI WAH
ALIBAHAR W.
GHAR W.
PRITCHARD TRAP
DHAMRAO WAH
SATHIO WAH
MAHULAKHO BR.
ANDHRU BR.
GAMBHIRO W.
GANGRAO CANAL
GANGRO W.
LARGE
MIRPURKHAS BR.
WEST BR.
MAHAR
TWIN
MAHAR
JHOL
KHAN
MANOR
DIM
KHAN
KHAN
KHAN

PLAN OF SIND.

SHOWING

ALL AREAS TO BE IRRIGATED

BY

LLOYD BARRAGE AND NEW CANALS

AND

EXISTING CULTIVATION IN AREAS

NOT COMMANDED BY BARRAGE.

TO ACCOMPANY THE IRRIGATION ADMINISTRATION REPORT FOR THE YEAR

1931—32

SCALE 10 MILES = 1 INCH.